Nova Scotia

ANNUAL REPORT

for the fiscal year
ending March 31, 1986

Department of Mines and Energy

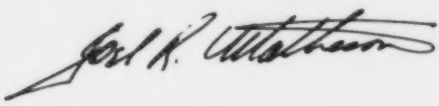
PROVINCE OF NOVA SCOTIA
DEPARTMENT OF MINES AND ENERGY

The Honourable Alan R. Abraham, C.D.
Lieutenant-Governor of Nova Scotia

Sir:

I have the honour to submit herewith the Annual Report of the Department of Mines and Energy of the Province of Nova Scotia for the period April 1, 1985, to March 31, 1986.

Respectfully submitted,



Joel R. Matheson, Q.C.
Minister of Mines and Energy

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DEPARTMENT OF MINES AND ENERGY

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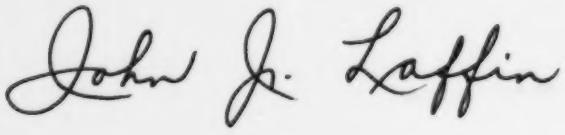


John J. Laffin, P. Eng., F.E.I.C.
Deputy Minister

TABLE OF CONTENTS

Minister's Letter of Transmittal 3

Deputy Minister's Letter of Transmittal 5

Deputy Minister's Report 11

Organization and Personnel of the Department 15
- Organization 15
- Responsibilities 15
- Personnel and Offices 17

Mines and Minerals Branch 19

Mineral Resources Division 21

- Project Geology Section 22
  - Introduction 22
  - Projects 23
  - Education and Public Awareness Programs 26
  - Editing and Publishing Services 28

Mining Engineering Division 29
- Introduction 29
- Significant Events in 1985-86 29
- Mining Examinations 30
- Mining Engineering Section 32
- Mine Inspection Section 32
- Drill and Mechanical Section 32

Mineral Development Division 35
- Registry of Mineral and Petroleum Rights 36
- Resource Geology Section 39
  - Introduction 39
  - Halifax Office Activities 39
  - Industrial Minerals Projects 40
  - Land Use Policy Development 44
  - Library Services 46
  - Metallic Minerals 47
  - Mineral Inventory 47
  - Stellarton Office Activities 49
  - Drill Core Library 50

Exploration Monitoring 55
Technical Support Services 55
Mineral Exploration and Development Review 57

Energy Branch 67

Energy Resources Division 69
Introduction 69
Petroleum Resources Section 70
Introduction 70
Offshore Exploration and Development 71
Onshore Exploration Activity 76
Coal Section 76
Introduction 76
Development and Utilization 77
Coal Exploration 81
Peatland Inventory 83
Oil Substitution and Conservation 85
Energy Management Division 87
Introduction 87
Changes in Organization 87
Activities 87
Energy Awards 89
Energy Programs Section 90
Residential Energy Programs 91
Energy Education Program 92
Provincial Energy Analysis Program 92
Economics and Statistics 93
Introduction 93
Activities 94
Energy Project Engineering Section 95
Introduction 95
Activities 95

Administration Division 97
Accounting Services Section 97
Mineral Taxation and Fiscal Planning Section 98
Mineral Royalties and Taxes 98
Coal Mine Investment Security Program 99
Novaco Limited 99
Personnel and Administration Section 99
Cartographic Section 101

Financial Information 103

Legislation 109

Appendix A — Publications 113
Mines and Minerals Branch 113
Energy Branch 114

Appendix B — Production Information from Mines, Quarries, and Other Operations 115
Metal Mines 115
Coal Mining Operations 117
Industrial Minerals 122
Aggregate Resources 134
Miscellaneous Materials 140

FIGURES
Text

1. Organization of the Department 16
2. Project locations for the Mineral Resources Division 23
3. Project locations for the Mineral Development Division 40
4. Locations of private sector gold and base metal exploration projects 58
5. Location of private sector industrial minerals exploration and development projects 62
6. Location of second round exploration agreements 72
7. Location of lands returned to the crown 73
8. Exploration well locations around Sable Island 74
9. Exploration well locations 74
10. Location of exploration projects for the Coal Section 76
11. Peatland concentrations 83
12. Historical review of royalties and taxes 98

Appendix B

B-1 Location of the tin mine, coal production sites and coal development projects 117
B-2 Location of industrial minerals production sites 123
B-3 Location of aggregate resources producers 134

TABLES
Text

1. Examination results for certification 31
2. Annual drilling statistics 33
3. Departmental drill holes completed during 1985-86 34
4. Mineral exploration Trends 37
5. Drill core acquisitions 51
6. Sources of drill core 50
7. Second round exploration agreements 71
8. Beneficiation potential of Eastern Canadian coals 79
9. Provincial energy analysis program 93
10. Royalties and taxes 99
11. Personnel changes during fiscal year 1985-86 100
12. Financial information about the Department 103

Appendix B

B-1 Metals production for the calendar year 1985 116
B-2 Coal production for calendar year 1985 118
B-3 Industrial minerals production for calendar year 1985 124
B-4 Secondary mineral manufacturing for the calendar year 1985 133
B-5 Aggregate resources production for the calendar year 1985 135
B-6 Miscellaneous commodities production for the calendar year 1985 141

DEPUTY MINISTER'S REPORT

John J. Laffin, P. Eng., F.E.I.C.

The mandate of the Department of Mines and Energy is the encouragement of research and development leading to increased mineral and energy resources and the orderly regulation of these activities for the benefit of all Nova Scotians. The Department accomplishes this mandate through many programs supervised by its six divisions. Many of these programs are developed and funded through co-operative federal and provincial agreements.

Two of these agreements are assisting the Department to meet its mandates. The Canada-Nova Scotia Mineral Development Agreement (CNSMDA), which was signed in June 1984 with a value of $27 million, is stimulating the growth of the Province's mineral resources sector through five major programs. These are:

- Geoscience exploration activities,
- Mineral research and technology activities,
- Mineral development activities,
- Private sector financial assistance, and
- Public information activities

These five programs are administered through the Mines and Minerals Branch of the Department. Individual projects encompass directed geological research to find mineral deposits, encouragement of the use of non-traditional mineral commodities, search for new markets and experiments for new beneficiation techniques.

During the fiscal year, a memorandum of Agreement was signed by Canada and Nova Scotia for the implementation of a new program on conservation and renewable energy projects. The value of the Agreement is $6.7 million over two years.

These Agreements and other programs managed by the Department are assisting the mineral and energy industries in the province. The mineral industry contributes significantly to the Province's gross provincial product. The more than 80 mines and quarries in Nova Scotia employed more than 5,800 people directly and a large number of others indirectly. The value of all mineral commodities produced in the province increased to $3.55 million from $3 million.

Exploration for minerals at former mining areas and for new mineral occurrences continued at a high level. Approximately $8 million were spent in mineral exploration in 1985 compared to $7.3 million in 1984. Although the number of exploration licenses declined from 1039 to 1025, the total area of exploration increased from 1.258 million acres (509 400 ha) to 1.288 million acres (521 600 ha).

Optimism in the future for the mineral resources sector continues. Nine major mining development projects were underway during fiscal year 1985/86. Pioneer Coal Company continues to develop its surface mine operation near Westville, Pictou County. Suncor is working on a coal development project east of Stellarton, Pictou County. In Cape Breton, the Cape Breton Development Corporation (CBDC) is continuing its mine development at Donkin (Donkin-Morien Development Project) and Lingan (Phalen Colliery Development). A new gypsum quarry operation is under development by Georgia-Pacific Corporation at Sugar Camp Lake north of Port Hawkesbury. The East Kemptville surface tin mine of Rio Algom Ltd. was in production for the first full year and has provided a strong impetus to metal mining in the province. Seabright Resources Ltd. has brought two gold properties, Beaver Dam, Halifax County and Forest Hill, Guysborough County, to the underground development stage.

Development of the Province's offshore energy resources continues at a lower pace than in fiscal year 1984-85. Although the number of drilling rigs searching for oil and natural gas reserves has decreased from last year, significant exploration programs are still being maintained. Most of the exploration is in the vicinity of Sable Island. Additional drilling for the Venture Gas Project has continued to define natural gas reserves.

The partners in the Venture Gas Project have made applications to regulatory agencies for gas export permit.

New regulations governing onshore oil and gas exploration came into effect during the fiscal year and will provide an attractive climate for onshore exploration. In the offshore, eleven second round exploration agreements have been concluded between governments and industry. The agreements affect 3.9 million acres (1.6 million ha) of the offshore jurisdiction.

The Department has continued its research and development programs for coal in order to reduce the Province's dependency on imported oil. Continued geological investigations supported by diamond core drilling is helping to define coal reserves in Cumberland, Colchester, Pictou, Inverness and Cape Breton Counties. The Committee on Atlantic Coal, chaired by the Deputy Minister of

Mines and Energy, is assessing and developing the beneficiation potential of mineable Eastern Canada coals. The Department is directing the research and development necessary for coal liquifaction through a contract with the Nova Scotia Research Foundation Corporation. Nova Scotia coal is being used for testing materials for use in fluidized bed combustion burner by the Nova Scotia Power Corporation. Through CNSMDA funding, all information on coal is being combined in the coal database.

During the fiscal year, Nova Scotia has reduced its dependency on petroleum in total energy consumption from 67% in 1984/85 to 62.4% in 1985/86. Primary energy use decreased 2.2% to 226.18 trillion BTU (238.39 trillion kJ).

The Energy Branch of the Department completed *Energy Plan 1985* that outlined the broad energy policy options available to the Province. In addition the Branch provided monitoring and analysis of issues affecting gas markets and energy pricing policies. Small businesses and government agencies benefitted from a total of 499 energy analyses of buildings which resulted in an average energy savings of 14%.

Nova Scotia hosted the National Mine Rescue Competition on 1985 at the Miners Forum, Glace Bay. The Nova Scotia team from the CBDC Lingan Colliery won the competition.

With the proclamation of the Occupational Health and Safety Act, the Department's responsibility for mine inspection, mine rescue and first aid training was transferred to the Department of Labour and Manpower.

Mining and production of mineral commodities proceeded during the fiscal year without any fatalities.

Working with the highly motivated and professional staff of the Department is a pleasure. Their work, achievements and publications are described in the following pages. I wish to thank the Minister of Mines and Energy, the Honourable Joel R. Matheson, Q.C., for his advice and assistance during the year.

Nova Scotia is well endowed with mineral and energy resources. It is a good location for the development of energy and mineral related projects because of its varied geology, strong workforce, geographical location and history of mineral and energy development.

ORGANIZATION AND PERSONNEL OF THE DEPARTMENT

ORGANIZATION

The Department of Mines and Energy is organized into six divisions. Three of these divisions, Mineral Resources, Mineral Development and Mining Engineering are grouped together in the Mines and Minerals Branch under an Assistant Deputy Minister (ADM). The Energy Resources and Energy Management Divisions form the Energy Branch, also under the direction of an Assistant Deputy Minister. The two ADMs and the Director of the Administration Division report to the Deputy Minister. The organization of the Department as of 31 March, 1985, is shown in Figure 1.

RESPONSIBILITIES

Mineral Resources Division: responsible for the assessment of the Province's mineral potential:

- Investigates the geology and documents mineral occurrences of the Province through its own scientific programs and through analyses of private sector exploration activities
- Provides nontechnical information, through maps, brochures, pamphlets and talks, about the geology and mineral resources, exploration and mining in Nova Scotia.

Mining Engineering Division: responsible for ensuring that Nova Scotia mines are developed according to current safety, environmental and mining practices and regulations:

- Conducts engineering studies
- Approves mining plans
- Administers departmental diamond drilling operations.

Mineral Development Division: responsible for issues involving the exploration and utilization of the Province's mineral resources:

- Maintains a mineral and petroleum rights registry
- Assists development of mineral resources
- Operates a technical publications library in Halifax and in Stellarton
- Maintains a core library and repository in Stellarton
- Monitors all private sector exploration work.
- Oversees the administration of Treasure Trove applications and exploration

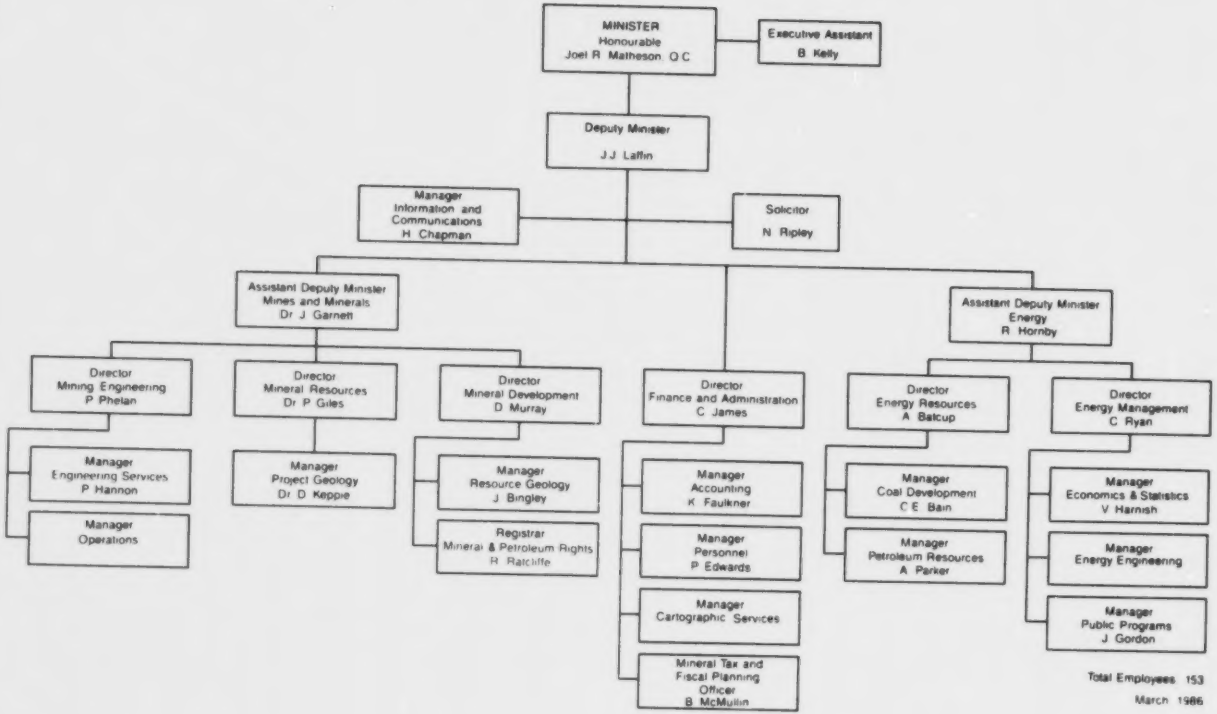


FIGURE 1. Organization of the Department.

Energy Resources Division: responsible for the development of the Province's indigenous energy resources: peat, coal, petroleum and natural gas:

- Monitors and regulates all petroleum exploration and development
- Undertakes coal and peat exploration programs
- Promotes energy resource development.

Energy Management Division: responsible for issues involving the supply of energy from outside the province and the demand for and utilization of energy within the province:

- Develops economic analyses and statistics on energy matters
- Provides engineering services related to energy use
- Develops and administers energy conservation programs
- Provides public information about energy.

Administration Division: responsible for providing financial and other support services to the divisions of the Department:

- Provides accounting, mineral taxation, legal and personnel services
- Administers coal mine/miner financial aid programs
- Provides cartographic and photographic services
- Provides accounting services for Novaco Ltd.

PERSONNEL AND OFFICES

The Department has 162 employees, most of whom are employed in Halifax and Stellarton. Local offices are maintained in Glace Bay and Springhill.

Halifax

Joseph Howe Building, 1690 Hollis Street

Mines and Minerals Branch	424-5346
Mining Engineering Division	424-5764
Mineral Development Division	424-4162
Energy Branch	424-5351
Energy Resources Division	424-5933
Energy Management Division	424-5019
Administration Division	424-4629

Brewery Complex, 1496 Lower Water Street

Mineral Resources Division	424-4700

Stellarton

32 Bridge Avenue — 752-843
- Mineral Development Division
  (resource geology, exploration monitoring, core library)
- Energy Resources Division
  (coal exploration)
- Engineering Division
  (drilling, maintenance work; mine inspection)

Glace Bay

Chernin Building, 10 Commercial Street — 849-7500
- Engineering Division
  (first aid, mine inspection)

Springhill

29 Main Street — 597-3963
- Engineering Division
  (mine inspection)

MINES AND MINERALS BRANCH

J. A. Garnett, Ph.D., P.Eng.
Assistant Deputy Minister

The mineral resources of Nova Scotia and the mines that produce them are an important part of the provincial economy. These mining activities provide direct employment for more than 5,800 people. The development and well-being of the Province's mineral resources sector is an essential part of the work of the Mines and Minerals Branch of the Department.

The Branch has a mandate to promote the understanding of the geology and mineral resources of the Province, the exploration, development and efficient production of mineral deposits, and the maintenance of safe and environmentally acceptable mining practices.

Three divisions report to the Assistant Deputy Minister for Mines and Minerals. The Mineral Resources Division explores, assesses and publicizes the Province's mineral wealth. The Mining Engineering Division ensures that mines in Nova Scotia are developed according to current safety, environmental and mining practices. The Mineral Development Division promotes the exploration and utilization of the Province's mineral resources.

MINERAL RESOURCES DIVISION

P. S. Giles, Ph.D., Director

INTRODUCTION

A prerequisite to the orderly development of Nova Scotia's mineral resources is a sound understanding of geology, geochemistry and known mineral deposits. The mandate of the Division is to provide, through its geological investigations, new and enhanced resource information to government and to the mineral exploration community.

The Canada-Nova Scotia Mineral Development Agreement (CNSMDA) continues to provide supplementary funding, permitting expanded levels of activity for Division staff. To accommodate staff expansion from this increased level of activity, on April 1, 1985, the Division was transferred to offices at the Brewery Market complex, 1496 Lower Water Street, Suite 312.

ACTIVITIES

Geological investigations in progress include regional bedrock mapping, mineral deposit studies, geochemical surveys, a study of Quaternary glacial deposits and their geochemistry, and regional assessment of the role of plate tectonics in mineral deposit genesis. In addition, the Division has undertaken a program entitled the Education and Public Awareness Program, to bring to the public an appreciation of the Province's mineral industry and its importance to Nova Scotia's continued economic development. All activities are completely or partially funded by the CNSMDA.

Regional mapping projects focus on the major granite batholith extending from Halifax westerly to the Yarmouth area, which hosts the East Kemptville tin deposit and has potential for additional granite-related deposits. In addition, the Cumberland sedimentary basin, with proven coal and salt resources and potential for potash and base and precious metals deposits, is the object of a second major mapping project. The enhanced information base provided by these projects will provide direct assistance to mineral exploration in these areas.

Detailed knowledge of specific mineral deposits provides the understanding necessary to assess the potential for other similar deposits, as well as key information for mineral exploration activities. Current national emphasis on gold and other precious metals is reflected in exploration activity in Nova Scotia and is similarly emphasized in divisional mineral deposits studies, particularly in the Meguma Group of southern Nova Scotia. An emerging recognition of potential for granite-related precious metals deposits links these studies with regional mapping of the South Mountain Batholith.

Regional exploration geochemistry and studies of the glacial deposits that mask much of Nova Scotia provide valuable tools for mineral exploration through the identification of areas with elevated metal concentrations that may express hidden mineralization in bedrock. Study of the veneer of glacial deposits likewise provides valuable clues to the nature of the underlying bedrock and also assists in tracing indications of local mineralization to a bedrock source.

The relationship between global plate tectonics models and mineral deposits can provide new insight into Nova Scotia's potential for mineral deposits based on analogy with other geologically similar areas. A province-wide investigation will attempt to make this comparison based on modern tectonic concepts.

The Division continues to emphasize the importance of mining and mineral exploration to the Province through a variety of educational programs designed for the general public. In addition, considerable emphasis is placed on the timely preparation of technical reports and maps, which enable new data generated to be applied for a variety of purposes relevant to resource development.

Members of the Division were actively involved in the management of programs funded by the CNSMDA during the fiscal year. The director is a member of the Management Committee and co-chairperson of the Geoscience Subcommittee. The section manager is the CNSMDA coordinator. The head of the Education and Public Awareness Program is co-chairperson of the Public Information Subcommittee.

Project Geology Section

J. Duncan Keppie, Ph.D., Manager

INTRODUCTION

The purpose of the Project Geology Section is to provide long-term geological research that will increase the knowledge about the geological development and mineral deposits of the Province. Projects undertaken by geologists in the Section focus on the development of broad structural features and their associated mineral occurrences and deposits. The Section provides support for the Mines and Minerals Branch Education and Public Awarness Program. Funding from the CNSMDA Geoscience and Public Information Programs supports most of these activities in the Section. The location of projects is shown on Figure 2.

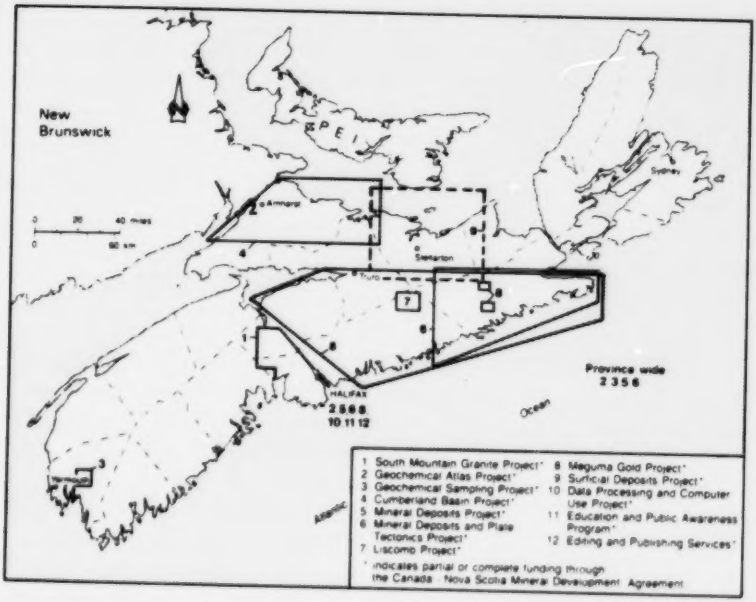


FIGURE 2. Project locations for the Mineral Resources Division.

PROJECTS

Nine major projects were underway during fiscal year 1985/86. Twenty geologists from the Section worked in various locations across the province to unravel the geological development and explore mineral deposits.

South Mountain Granite Project

The CNSMDA is supporting the study of South Mountain Granite, a large body stretching from Halifax to Yarmouth. The project goal is to test the potential of this large granite body to host East Kemptville-type deposits (tin-zinc-copper-silver) and other deposits (tungsten, gold, molybdenum, manganese, beryllium and rare earths).

The summer of 1985 was the first field season for this project. Work was divided between two teams of geologists mapping the bedrock and the surficial deposits of the Halifax Peninsula region and the area east of Route 14.

Seven 1:50 000 preliminary maps of the bedrock and surficial till deposits (glacial till) have been produced from the 1985 work. Eventually maps of the entire granite regional and the accompanying surficial deposits will be produced.

Geochemical Studies

The goal of this project is to produce an atlas of maps on different scales that shows the distribution of selected elements in lake bottom sediments, stream silts, and soils and rocks across the province. Such an atlas provides a great incentive for exploration companies to continue looking for mineral deposits in Nova Scotia.

During the 1985/86 fiscal year, selected areas of the province were resampled for stream and lake sediments. The study of the distribution of elements from streams in the eastern Cobequid Highlands continued as a cooperative project with the Geological Survey of Canada. This study represents a new approach to geochemical investigation through the study of individual catchment basins of streams. Exploration companies have shown considerable interest in this new technique of mineral exploration.

Cumberland Basin Project

The Cumberland Basin is a large area of sedimentary rocks stretching from Springhill area through Oxford to Tatamagouche in Cumberland, Colchester and Pictou Counties. The purpose of the work is to provide an understanding of the succession rocks, their ancient environments and their mineral resources. The region is known to have reserves of coal and occurrences of copper, lead, zinc, uranium, vanadium, gold and silver. The Province's two salt mines are located in this basin. The salt in these deposits and others has potential for discoveries of potash.

The Canadian Salt Company mine at Pugwash is part of a detailed study of salt deposits and related minerals occurrences. A geologist is mapping the salt deposits underground to understand how these deposits formed.

Mineral Deposits Project

Nova Scotia has a variety of mineral deposits in complex geological environments. Some of these mineral deposits and potential areas for them are being studied in the South Mountain Granite Project. Other mineral deposits are also being investigated through this project. The study of gold occurrences and deposits is another project.

This project focuses on base metals (copper, lead, zinc and related gold and silver) in many different areas of the province. The purpose is to understand how certain deposits formed (for example, Walton, Hants County, and Stirling, Richmond County) and how others, not yet discovered, may be defined. It is a cooperative project involving geologists from the Geological Survey of Canada and Dalhousie University, as well as from the Department.

Another part of the project is the study of mineral deposits and occurrences associated with the South Mountain Granite. Northeast of New Ross, Lunenburg County, the Department drilled several exploration holes to test the mineralization at the Dean and Chapter Manganese Mine. Several mineralized zones were discovered as deep as 1000 ft (300 m).

Metallogenic Map Project

This project is designed to stimulate exploration for known and suspected occurrences of minerals in the province. The end product will be a map and major report showing the important structural features of Nova Scotia (faults and folds) in terms of how they were produced by movement of crustal plates and the associated mineral occurrences. The importance of this work is that it becomes a tool in assessing and predicting the Province's minerals and mineral potential.

During the 1985 field season, work centred on the folds, faults and granite bodies in Guysborough and eastern Halifax Counties.

Liscomb Complex Project

As part of the geological work funded by the CNSMDA, all granite bodies in southern Nova Scotia will be investigated by the Geological Survey of Canada and the Department. One of these granites is the Liscomb Complex located on the northwestern edge of the Liscomb Game Sanctuary, Halifax County.

Work began in 1985 on a detailed geological map and an investigation of the area's mineral potential.

Meguma Gold Project

The gold-bearing rocks of the Meguma Group are found across southern Nova Scotia from Canso to Yarmouth. Historically, this area supported mining in 64 gold districts from 1861 to 1940. Geologists working on this project are re-examining some of these former gold-producing areas to stimulate exploration for gold. During the 1985 field season work continued in the geological mapping

of the Cochrane Hill and Goldenville districts, Guysborough County. These former gold mining areas have been the target of considerable investigation by exploration companies.

At the former gold-antimony mining area of West Gore, Hants County, the Department drilled an exploration hole to test the extension of mineralization from the old mining site. The 2,100 ft (640 m) hole penetrated the overlying Horton Group, which has a potential for ancient gold placer deposits, and the underlying the gold bearing Meguma Group. Although no gold or antimony mineralization was found, the indications in the rock were encouraging for future exploration.

Surficial Deposits Project

Research work on surficial deposits is designed to describe the glacial history of Nova Scotia and the geochemistry of the glacial deposits. By studying how glaciers have moved, the materials they have transported and the chemistry of the deposits, exploration companies may be able to locate buried mineral deposits.

Most of Antigonish County and parts of Pictou and Guysborough Counties comprised the study area for the project during the 1985/86 fiscal year. Activities of this project began in 1981 under the Canada-Nova Scotia Cooperative Mineral Program and continued with support from the CNSMDA. It is a co-operative project with the Geological Survey of Canada.

Data and Word Processing Assistance Project

In late 1985 a consultant's report recommended that the Department acquire more convenient and timely access to electronic data processing facilities. During the remainder of the fiscal year the Mineral Resources Division purchased several IBM compatible personal computers. Use of these machines and training of staff began immediately. Most of the data processing previously done through Dalhousie University is now completed within the Division. Some staff are using the personal computers for word processing. A process was developed to permit the transfer of word processing files both ways from the personal computers to the Micom word processors. The installation of personal computers has enhanced the Division's ability to develop manuscripts and process data.

EDUCATION AND PUBLIC AWARENESS PROGRAM

The purpose of the Education and Public Awareness Program is to produce and promote educational information about the geology, mineral resources and

mining history of the Province and about the geological projects of the Mines and Minerals Branch. The Prospecting Course, displays, the annual Open House and publications are ways of meeting this goal.

Since the signing of the CNSMDA in June, 1984, Program staff have had additional responsibilities. Another objective now is to describe and promote the CNSMDA and its programs. Displays feature information about the CNSMDA. Special publications, such as the Mineral Investment Stimulation Program (MISP) information package for private sector assistance, are typical of new publication responsibilities. In cooperation with Energy, Mines and Resources Canada, Communications Branch, a newsletter, *Prospectives*, is published twice a year.

Prospecting Course

During the fiscal year 1985/86 the course entitled Prospecting and Geology in Nova Scotia was offered twice. During the autumn the course was offered in Truro; the spring course in Halifax marked the seventh time the course has been offered. To date, more than 150 people have taken the course.

The course covers identification of rocks and minerals, use of maps and airphotos, preparation of geological maps, prospecting techniques and the role of the Department in exploration. The Chamber of Mineral Resources of Nova Scotia, the Department of Mines and Energy, the Colchester-East Hants School Board and Dalhousie University sponsor the course.

Displays

The Education and Public Awareness Program is responsible for displays pertaining both to mineral resources and mining in the Province and to the projects of the Mines and Minerals Branch. Displays at technical meetings and various exhibitions across Nova Scotia during the fiscal year presented information about previous gold mining, mineral exploration and development, the Province's mineral resources and the programs of the CNSMDA.

During the summer of 1985 displays were staffed in four shopping centres in different parts of the province. In addition, major displays were prepared for the Nova Scotia Forestry Exhibition (Windsor), Mining Society of Nova Scotia (Ingonish), Rockhound Roundup (Parrsboro), CIMM-sponsored Conference on Granite Mineralization (Halifax), Underwater Mining Association of Canada (Halifax) and the Prospectors and Developers Association (Toronto).

At the annual meeting of the Prospectors and Developers Association two displays were established. One introduced the Department and the mineral exploration and potential of the Province. The second display focused on the mineral potential for tin, tungsten, gold and silver in the South Mountain Granite region of Nova Scotia.

Open House

Each year the Mines and Minerals Branch hosts the Open House and Review of Activities. The event was held on November 27 and 28, 1985. More than 220 people attended the function to hear talks and see displays by geologists from the Department, the Geological Survey of Canada and Nova Scotia universities.

EDITING AND PUBLISHING SERVICES

Detailed technical publications are the principal means of communicating information about the geology and mineral resources of Nova Scotia. The technical reports are published either as part of the Department's publications series or in scientific journals. In addition, divisional staff give lectures and talks at scientific meetings, local universities and schools, and to community groups. The Education and Public Awareness Program produces brochures and pamphlets for the general public. All of these publishing activities are supported by a senior editor, an editor and two word processing operators.

Technical summaries for each of the projects appear in the annual *Mines and Minerals Branch Report of Activities*. Brief descriptions of each project appear in the annual Open House and Review of Activities publication *Program and Summaries*. A list of publications by the geologists of the Section, as well as other Departmental publications, appears in Appendix A.

MINING ENGINEERING DIVISION

P. W. Phelan, P.Eng., Director

INTRODUCTION

The Mining Engineering Division is responsible for the administration and regulation of the mining industry in the province on behalf of the Department of Mines and Energy to ensure that the Province's mineral and energy resources are utilized in an efficient and environmentally acceptable manner. This includes recommending the approval of new mining leases and modifications to existing mining operations, conducting technical and feasibility studies for new mining projects, initiating and supervising research to better utilize mineral resources, etc. The Division provides a diamond drilling service to the Mineral Resources, Mineral Development and Energy Resources Divisions of the Department and is responsible for maintaining the equipment and facilities necessary for the drilling activities and for providing maintenance services for Department vehicles and equipment.

SIGNIFICANT EVENTS IN 1985-86

Two new mine leases were issued, one to Nova Scotia Sand and Gravel for a silica sand deposit near Belmont, Colchester County, and one to Mosher Limestone for an agricultural limestone deposit near Cook's Brook, Halifax County.

The Province hosted the National Mine Rescue Competition in September, 1985. It was revived by the Minister to the delight of the eight participating teams from six provinces and the two territories. The competition was won for Nova Scotia by the team from the Lingan-Phalen Mine operated by the Cape Breton Development Corporation.

Responsibility for mine inspection was transferred to the Nova Scotia Department of Labour and Manpower on January 1, 1986, following implementation of the *Occupational Health and Safety Act*. The Mine Inspection group, under the direction of the Chief Inspector of Mines, was transferred to the Department of Labour and Manpower at that time.

A project to locate and evaluate dangerous abandoned mine openings in the province was completed in 1985. A program to fill in the dangerous abandoned mine openings on Crown land is under consideration.

Rio Algom Ltd. continued tune-up work on its 9,918 tons (9 000 t) per day surface mine in Yarmouth County, which is expected to produce 4,848 tons (4 400 t) of tin, 2,645 tons (2 400 t) of zinc and 1,653 tons (1 500 t) of copper

in concentrates per year. Seabright Resources Inc. continued advanced exploration work on two gold deposits in Eastern Nova Scotia: at Beaver Dam, Halifax County, and at Forest Hill, Guysborough County. Suncor Inc. continued exploration work and studies for the development of a large underground coal mine in the Pictou coal field near Stellarton.

The Division worked closely with CANMET on the research and technology sector of the Canada/Nova Scotia Mineral Development Agreement. Projects completed include two studies: *Effects of Location on Mine Development Potential: Nova Scotia's Competitive Position in Canada,* and *The Gypsum Industry in Nova Scotia: Present Status and Future Prospects.*

The Division's Drilling and Maintenance Section drilled 14 holes for the Department for a total footage of 20,538 ft. (6 260 m).

Several computer software programs were created or modified for the Department, including geostatistical reserve estimation programs, a sophisticated cash flow program, a coal preparation plant simulator and various graphics programs.

MINING EXAMINATIONS

Board of Examiners

The Coal Mines Regulation Act requires that any position in underground coal mines be filled by an individual who has an appropriate "Certificate of Competency" issued under the Act. A Board of Examiners, appointed under the Act, is responsible for issuing the certificates.

The Board consists of five members appointed by the Minister of Mines and Energy:

A. MacKenzie, P.Eng., Glace Bay
H. Slaunwhite, P.Eng., Sydney
J. Reid, P.Eng., Sydney
K. MacLeod, P.Eng., Sydney
W. Fell, P. Eng., Halifax

The Secretary to the Board is P. Phelan, P.Eng., Halifax.

Responsibility for the Board of Examiners was transferred to the Department of Labour and Manpower on January 1, 1986.

Certificates of Competency

Training in and examinations for seven categories were held at University College of Cape Breton. The categories are Mine Supervisor, Mine Examiner, First and Second Class Mine Electrician, First and Second Class Mine Mechanic, and Hoist Operator. Examinations were also held for the certificate of competency as Mine Manager and Underground Mine Manager. The Cape Breton Development Corporation also conducted training at its facilities under programs approved by the Board of Examiners.

Each year the Mining Society of Nova Scotia awards a prize to the person who achieves the highest grade in examinations for Mine Manager, Underground Mine Manager and Mine Supervisor. In 1985 awards were made in three categories:

Manager — Alan C. Harvey
Underground Manager — James C. MacLellan
Mine Supervisor — John Leonard Cholock

The results of the examinations are shown in Table 1.

TABLE 1. Examination Results for Certification Under the Coal Mines Regulation Act

Category	Number of Candidates
Manager	3
Underground Manager	3
Supervisor	6
Mine Examiner	30
Hoist Operator	7
Mine Electrician, 1st Class	38
Mine Mechanic, 1st Class	25
Console Operator	8
TOTAL	120

All examination candidates were successful.

Mining Engineering Section

P. J. Hannon, P.Eng., Manager

The Mining Engineering Section is responsible for ensuring that the Province's mineral and energy resources are utilized to their optimum, and that mining operations are conducted in a safe, efficient and environmentally acceptable manner.

This includes reviewing proposals from industry for new mining projects or modifications to existing mines, and making recommendations for the issuing of mining leases and permits. The Section also provides technical advice and assistance to industry and government on mining problems, and conducts economic and feasibility studies for new mineral projects.

Mine Inspection Section

W. J. Fell, P.Eng., Chief Inspector

With the reorganization resulting from the passage of the *Occupational Health and Safety Act*, the Mine Inspection Section was transferred to the Nova Scotia Department of Labour and Manpower effective January 1, 1986. Statistics for mine safety for 1985/86 and subsequent years will be available from the Department of Labour.

Drill and Mechanical Section

D. Polley, Manager

The Drill and Mechanical Section is responsible for operating the Department's diamond drills and maintaining all mechanical equipment and vehicles.

All drilling in 1985 was conducted for various Divisions within the Department. No drilling was carried out for other government departments or private companies.

The amount of departmental drilling completed during the last several years is shown in Table 2. Details of 1985/86 drilling are given in Table 3. Further details about individual holes are given in the annual publication *Drill Logs of Government Core Drills*.

TABLE 2. Annual Drilling Statistics

Year	Number of Holes	Amount Drilled	
		Feet	Metres
1982-83	84	22,189	6 763
1983-84	76	19,862	6 054
1984-85	27	17,434	5 314
1985-86	14	20,538	6 260

Table 3. Departmental Drill Holes Completed during 1985-86

Site Name	Map Ref.	Hole Design	Co-ordinates E	Co-ordinates N	Drilled ft.	Drilled m	Date Completed
Big Tom Wallace Lake	21A/05D	MRR-D-1	5402832	4928027	4,721	1 439	26-9-85
Island East River	11E/07D	E2	702071	16529434	2,083	635	30-4-85
Sinclair Lake	11E/01A	SL-1	264006	4993049	1,099	335	18-7-85
		SL-2	264000	4992875	1,050	320	9-8-85
Maple Brook	11F/14B	MB-1	322978	5073097	1,027	313	2-9-85
		MB-2	322770	5073341	495	151	11-9-85
Springhill	21H/09D	SH99	416987	5055312	912	278	26-9-85
Riverside Corner	11E/04C		439281	4997294	3,450	1 051	24-3-86
Dean Chapter Lake	21A/16B	DC 85-1	—	—	404	123	29-10-85
		85-2	—	—	718	219	27-11-85
		85-3	—	—	1,482	452	4-3-86
Lyons Brook	11E/10C	SMB-1	203402	5058796	154	47	24-3-86
(Sawmill Brook)		SMB-2	203376	5058768	157	48	25-3-86
		SMB-3	203376	5058791	125	38	27-3-86
Lewis Road (Chance Harbour)	11E/10D	P58	219148	5059060	2,661	811	1-3-86
				TOTAL	20,538	6 260	

MINERAL DEVELOPMENT DIVISION

D. A. Murray, M.Sc., Director

The Mineral Development Division is divided into two sections, the Resource Geology Section and the Mineral and Petroleum Rights Section. The responsibilities of the Division lie in the orderly development and promotion of the Province's mineral resources. Included in these responsibilities are mineral resource regulations, mineral titles policies and assistance in the promotion and development of all minerals. It also maintains geological information through the departmental libraries and drill core library. The Division monitors mineral production and mineral exploration activity in the province and provides liaison among mineral producers, the exploration research establishments, landowners and government agencies. Collection and compilation of mineral production and exploration statistics is another important function of the Division.

Revision of the Mineral Resources Act continued through 1985 and is nearing completion. Discussions also continued with the Chamber of Mineral Resources of Nova Scotia regarding proposed changes to the Mineral Resources Act. As well, the Chamber of Mineral Resources sponsored an open forum to discuss the suggested changes with any interested parties.

The Canada-Nova Scotia Mineral Development Agreement (CNSMDA) continued during the year and was expanded to include several industrial mineral projects a mineral resources promotion project, and a drill core information project.

Two Special Licenses were issued during 1985 which settled disputes between exploration companies and landowners in the Forest Hill area, Guysborough County, and at Fifteen Mile Stream, Halifax County. These Special Licenses allowed the exploration companies to explore on the above-mentioned properties under special terms and conditions.

The Registrar of Mineral and Petroleum Rights, Mr. Roy Slater, retired in July of 1985 and was replaced by Mr. Richard Ratcliffe. Mr. Ratcliffe's position as Assistant Registrar has not yet been filled.

Mineral and Petroleum Rights Registry

R. Ratcliffe
Registrar of Mineral and Petroleum Rights

The Mineral and Petroleum Rights Registry is responsible for receiving applications for mineral and petroleum rights and, subject to verification for accuracy and availablity of lands, for issuing and registering the licenses or leases. In addition, any documents affecting licenses, such as transfers of title, assignments of interest, option agreements, special licenses and exploration agreements, are registered by this office. The Registry also receives all statements of exploration expenditures and assessment reports that pertain to the renewal of licenses and leases. In addition to matters directly affecting licensing, maps showing the disposition of lands under license or lease are maintained and continually updated. Applications for underground gas storage rights and treasure trove licenses are processed through this office. Information concerning production and employment in Nova Scotia's mines and quarries is also received by the Registry.

A large number of inquiries from industry, the public and other government departments are answered each year. Most deal with procedures for obtaining licenses, information on past exploration and mining activities, statistical information on production for operating properties and general questions about licenses. A notable service to the public and industry is printing and supplying of land disposition mapsheets (scale 1:31 680), which are obtainable for a nominal charge. The Registry is responsible for all fees, bonds and other monies due for licenses, leases, statutory work deposits, payments in lieu of work and sale of maps and other items such, as acts and publications.

The Registry maintained a fairly high level of activity in 1985 (Table 4). In total, 1,025 exploration and development licenses were issued to 202 licensees for a total of 32,223 claims or 1,288,920 acres (521 619 ha). Sixty-five transfers were processed and 18 agreements received. During 1985, a total of $2,389,351 in assessment work was reported to have been conducted in the Province (Table 4). In support of this reported work, 108 assessment reports were receiveu in 1985. Registry staff participated in the review of the *Mineral Resources Act* and in the formation of Regulations under the *Petroleum Resources Act* which were brought into force October 30, 1985.

During the summer of 1985 a student with the Cooperative Education Program, St. Mary's University designed a computer program for the Registry's use. During 1986, many of the registry's operations will be included in electronic data processing. Substantial work was also undertaken to document production statistics from producing mines in the province from 1864 to 1985.

TABLE 4. Mineral exploration trends in Nova Scotia.

		1978	1979	1980	1981	1982	1983	1984	1985
SUMMARY (onshore)									
Value of Reported Assessment Work		$5,900,000	$4,700,000	$7,564,000	$ 8,441,270	$4,100,000	$4,200,000	$2,625,666	$2,389,351
Exploration Expenditure		—	—	—	$14,608,000	$5,553,000	$7,000,000	$7,300,000	$8,000,000[1]
Total Licences Issued		2,393	1,841	2,559	1,952	1,298	1,350	1,039	1,025
CLAIMS RECORDED ONSHORE									
Base Metal	claims[2]	38,597	40,497	88,703	68,863	39,626	40,630	26,627	27,809
	acres	1,543,880	1,619,880	3,548,120	2,754,520	1,585,040	1,585,040	1,065,080	1,112,360
	hectares	624 799	655 556	1 435 904	1 114 739	648 871	657 709	431 032	450 166
Uranium	claims	31,978	30,920	25,483	6,225	—[3]	—[3]	—[3]	—[3]
	acres	1,279,120	1,236,800	1,019,320	249,000	—	—	—	—
	hectares	517 653	500 526	412 513	100 769	—	—	—	—
Salt, Potash	claims	1,148	2,256	13,505	5,225	1,065	505	1,257	830
	acres	45,920	90,240	540,200	209,000	42,600	20,200	50,280	33,200
	hectares	18 584	36 519	218 616	84 581	17 240	8 175	20 348	13 436
Coal	claims	—	—	—	4,880	3,072	4,565	3,584	3,584
	acres	—	—	—	195,199	122,880	182,599	143,360	143,360
	hectares	—	—	—	996	49 729	73 897	58 017	58 017
Number of Mineral Assessment Reports		132	126	140	150	124	188	127	108
Total Areas Held	acres	2,868,920	2,946,920	5,107,640	3,212,520	1,627,640	1,827,999	1,258,720	1,288,920
Under Licence	hectares	1 161 036	1 192 601	2 067 033	1 379	709 219	739 781	509 397	521 619

TABLE 4. Continued

		1978	1979	1980	1981	1982	1983	1984	1985
PETROLEUM LICENCES ISSUED									
Land Areas	licences	37	44	52	99	68	93	106[4]	—
	acres	3,452,573	3,456,875	4,284,909	6,230,046	5,419,952	8,048,306	8,567,791[4]	—
	hectares	1 397 237	1 398 978	1 734 079	2 521 265	2 193 424	3 257 104	3 467 338[4]	—
Submarine Areas	licences	160	147	151	172	168	—	—	—
	acres	33,634,964	31,221,055	31,589,070	34,786,199	33,965,867	—	—	—
	hectares	13 611 883	12 634 978	12 783 921	14 077 781	13 745 798	—	—	—

[1]estimate from Nova Scotia Department of Mines and Energy sources.
[2]claims are 40 acres or 16.2 ha each
[3]uranium exploration and mining moratorium in effect
[4]as of July 1, 1984

March 11, 1987

Resource Geology Section

J. M. Bingley, B.Sc., Manager

INTRODUCTION

The Mineral Development Division's Resource Geology Section work with the mineral industry, government agencies, educational establishments and the general public through many functions that provide geological/geostatistical information and services. A Halifax staff of 11 and a Stellarton staff of eight full time employees provide the personnel resource while 12 to 18 casual staff provide seasonal support.

A staff increase of three geologists and a mineral technician was realized in the past year through implementation of projects under the Canada/Nova Scotia Mineral Development Agreement (CNSMDA). These new staff enabled the start-up of the Building Stone and Gypsum/Anhydrite Projects and increased activity in the Core Library Project. In 1985 the Resource Geology Section employed eight term staff through the CNSMDA, including those hired to conduct the Gold Inventory Project and the Land Use Policy Development Project. Four additional CNSMDA projects are set to begin in the next fiscal year which will require four professional term employees. Location of projects are shown on Figure 3.

HALIFAX OFFICE ACTIVITIES

The Halifax staff of the Resource Geology Section is located on the second floor of the Joseph Howe Building, 1690 Hollis Street, together with the Registry of Mineral and Petroleum Titles and Cartography Sections.

Functions performed and services provided include the following:

- maintenance of the departmental library which consists of extensive geological, mining and energy related materials and is open to the public,
- industrial minerals research (Building Stone and Gypsum/Anhydrite Projects) and assistance to industry,
- Gold Inventory Project,
- compilation of various mineral inventory type databases (GEOSCAN, drillholes, gold bibliography, etc.) and publication of same,
- compilation of databases and maps for the Land Use Policy Development Project, and
- compilation of printed and field research information for the Gold Inventory Project.

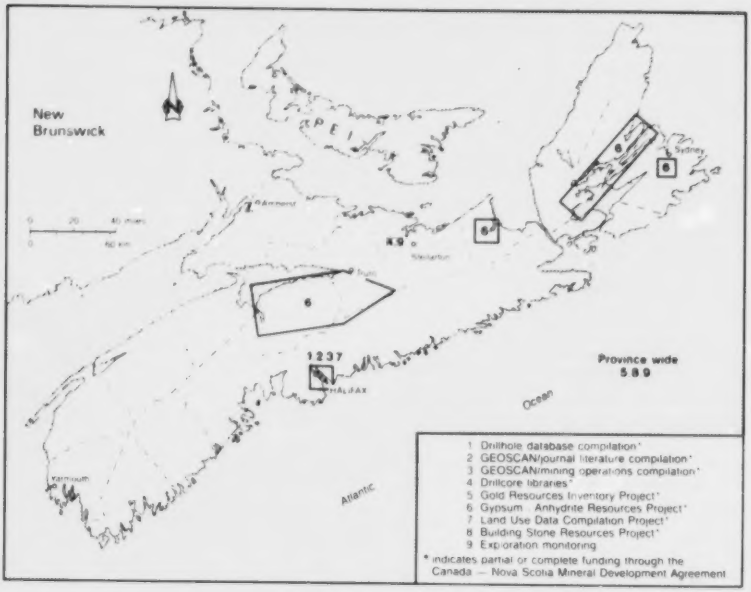

New Brunswick
P E I
Sydney
Province wide
5 8 9
Ocean
Atlantic
1 Drillhole database compilation*
2 GEOSCAN/journal literature compilation*
3 GEOSCAN/mining operations compilation*
4 Drillcore libraries*
5 Gold Resources Inventory Project*
6 Gypsum - Anhydrite Resources Project*
7 Land Use Data Compilation Project*
8 Building Stone Resources Project*
9 Exploration monitoring
* indicates partial or complete funding through the Canada — Nova Scotia Mineral Development Agreement

FIGURE 3. Project locations for the Mineral Development Division.

INDUSTRIAL MINERAL PROJECTS

As part of the Canada-Nova Scotia Mineral Development Agreement, the Department and Energy, Mines and Resources Canada initiated several industrial mineral programs designed to stimulate mineral development in Nova Scotia. These programs include commodity market studies, mineral technology programs and resource evaluation and documentation projects. Because of similar mineral development agreements with two other Atlantic Provinces (Canada — New Brunswick and Canada — Newfoundland) most of the market studies are regional in scope.

Building Stone Project

Program Objectives. The building stone project was initiated in September 1985 by the Mineral Development Division of the Nova Scotia Department of Mines and Energy and is jointly funded under the Canada-Nova Scotia Mineral Development Agreement. It is a five year program, which has as its primary goals:

- identification and evaluation of the building stone resources of Nova Scotia and
- preparation of promotional material on Nova Scotia's stone resources so as to attract and encourage private sector development of these resources.

The project will be carried out in two phases.

Phase I consists of mapping and sampling all old building and monumental stone quarries in Nova Scotia and will include sandstone, granite and marble rock types. The best areas will be selectively diamond drilled to test continuity and bed thickness. Some trenching and stripping may be undertaken during this phase. Phase 1 will also include cataloguing old stone buildings throughout the province and matching the stone in these buildings to the quarry source. This phase of the work, including a preliminary report, should be completed by March, 1987.

Phase 2 of the project will concentrate on developing detailed information on new quarry sites in Nova Scotia. Particular attention will be given to the better sandstones and granites for monumental and building cladding purposes. At that time promotional material will be prepared on Nova Scotia stone. A final comprehensive report on building and monumental stones of Nova Scotia will be completed in 1989.

1985 Field Program. Systematic identification, mapping and sampling of sandstone quarries was begun in September. Approximately 75 quarry sites were visited, the majority of which had caved in, were overgrown or simply had eroded from river banks. Ten quarries were located that produced significant quantities of stone for construction and monument purposes. Five of those were selected for a diamond drilling program that was begun in March 1986. The sites drilled were Sawmill Brook, McPherson Quarry, McKeen Quarry, Amherst Redstone Quarry and the MacMillan Quarry (Fig. 2).

Significant deposits of good quality sandstone were indicated at the Macpherson, Sawmill Brook and Amherst quarries.

Preliminary work was begun on a catalogue for Nova Scotia that will list all stone buildings in the province, with details on stone type, age, builder, architect, general condition of the building and other historical information.

Gypsum Anhydrite Project

The Gypsum Anhydrite Project was initiated in June 1985 to develop an inventory of the gypsum and anhydrite resources of the province. In addition to this primary objective, technical research has begun to investigate and stimulate alternate utilization of these resources and to develop better communications between government and the province's gypsum and anhydrite producers.

Thus far, a detailed technical compilation has been carried out using the maps, reports and assessment files of the Department and a partial compilation has been done of information generated from the computerized drillhole database. Visits have been made to all the Province's gypsum and anhydrite production facilities. In-depth discussions have been held with company and government representatives involved in the production and/or use of gypsum. Information compiled by these endeavors has already been used to help promote this industry.

Solid markets and increased production and consumption of gypsum over the past few years have heightened industry interest in Nova Scotia's gypsum resources. Several major wallboard producers have made fact finding visits to our offices during the past six months and have been encouraged and assisted in the procuring of information related to the feasibility of establishing a wallboard plant in Nova Scotia.

Utilization of gypsum and anhydrite in agriculture was the first subject looked at in the search for alternate uses. After much research and discussion with producers and agricultural officials in all three Maritime Provinces, enough favourable data was generated to encourage a local company to begin production of agricultural gypsum. A brief has also been compiled on the potential for agricultural gypsum markets in the New England states and this study is now available as an open file report.

Studies into the increased use of gypsum and anhydrite in the construction, mining, manufacturing (fillers) and agricultural industries are ongoing.

The publication *Gypsum Property Ownership and Leases* by Mark King is available as NSDME OFR 651.

Gypsum, anhydrite, and other industrial mineral locations and reserves will be shown on the *Industrial Minerals Commodities Map of Nova Scotia* by John H. Fowler. The map is in press.

Aggregate Resource Maps of Cape Breton. Two-colour, granular aggregate resource maps of Cape Breton Island have been published and are now available from the NSDME library (maps 85-3, 85-4, 85-5 and 85-6). Three maps locate and describe the deposits and the fourth map identifies pits and quarries throughout Cape Breton Island.

Market Studies

Through the CNSMDA, market studies of commodities increase the awareness of selected industrial mineral commodities and their uses. Both the Department and Energy, Mines and Resources Canada (EMR) have initiated the studies. Two studies funded by the Department are now available.

1. A study entitled *Current Market Economics of the Strontium Minerals* was completed by Metals Economics Group of Halifax, Nova Scotia and Boulder, Colorado and is available as Open File Report 648.

2. A study *The Gypsum Industry in Nova Scotia, Present Status and Future Prospects* has been prepared for the Nova Scotia Department of Mines and Energy by the Centre of Resource Studies, Queens University, Kingston, Ontario, and is available as NSDME OFR 752.

The following market studies are nearing completion through contracts awarded by the Department of Supply and Services Canada. These reports will be available as open file reports in 1986.

1. Market Analysis for Nova Scotia, New Brunswick and Newfoundland Dimension Stone. This study examines markets for building stone within reach of Nova Scotia, New Brunswick and Newfoundland. The contract was awarded to The DPA Group Inc.

2. Aggregate Materials Accessible from Nova Scotia and New Brunswick. This study identifies markets for aggregates beyond the geographical boundaries of New Brunswick and Nova Scotia. The contract was awarded to ADI Limited, Fredericton, New Brunswick.

3. An Industry Study of Industrial Minerals Used in Oil and Gas Exploration on the Eastern Canadian Offshore. The study identifies the various minerals and quantities of each of the industrial minerals used in offshore drilling operations. The contract for this study was awarded to Jacques, Whitford and Associates Limited. Provincial participation includes Newfoundland, Nova Scotia and New Brunswick.

4. Silica and Silica Sands Accessible from Nova Scotia and New Brunswick. The study identifies markets and specifications for silica and silica sand outside the province but within market range. The contact has been awarded to ADI Limited, Fredericton, New Brunswick.

Contracts have been awarded by Supply and Services Canada to consulting groups studying various industrial minerals and manufacturing techniques.

1. Development of Engineering Data on Nova Scotia Fly Ash. This study is to provide comprehensive engineering data to identify more extensive uses of fly ash in the concrete industry. The contract for this study was awarded to L. E. Shaw Limited.

2. Nova Scotia Silica Study. A detailed study on Nova Scotia silica deposits to identify beneficiation and processing procedures that could upgrade the product thereby creating additional marketing opportunities. The study is being done by Fenco Shawinigan Engineering Limited.

3. Nova Scotia Barite Study (deposits, development, markets). A study on barite deposits in Nova Scotia to identify required beneficiation procedures, market situations and ability of Nova Scotia producers to gain entry into additional markets. The contract for this study was awarded to Jacques, Whitford and Associates Limited.

LAND USE POLICY DEVELOPMENT

Through the CNSMDA, this Department is attempting to address the need to foster better understanding of Nova Scotia's mineral and energy resources by industry, the public and by other provincial departments. The Mineral Land Use Policy Development Project is being developed to channel mineral resource information to the provincial and municipal planning community. This community, mainly consisting of planners and land resource managers, is responsible for the designation, future use and zoning policies within Nova Scotia's many planning jurisdictions. As a result of this project, the planning community will be given clear, understandable, more accessible information on the Province's mineral and energy resources.

The overall objective of the project is to promote proper management and protection of mineral resources by providing information, interpretation, improved communication, and resource management guidance to the provincial and municipal planning system. A three phased approach, carried out over the duration of the present CNSMDA, will implement the objectives:

Phase one: Information gathering and creation of MINLU — a mineral land use information base. Products include a series of 24 Mineral Resource Land Use (MRLU) handbooks and maps.

Phase two: Compilation and production of Mineral Potential maps covering Nova Scotia.

Phase three: Preparation of policy recommendations concerning mineral, aggregate and energy land use. Groundwork will be laid for the adoption of provincial land use policy in accordance with section 8 of the Planning Act.

Protected and Limited Use Lands Map

Conflicting land uses and overlapping jurisdictions and legislation are creating complex land use problems that significantly impact on Nova Scotia's mineral resource potential. One such issue is the growing loss of access to land for exploration and mineral resource development.

A *Protected and Limited Use Lands Map* was compiled this year to show the location and distribution of lands that are alienated or have partially restricted access for exploration. This 1:500 000 scale map of the province shows that 12 per cent of the provincial land base is either protected or of limited use to the mineral and energy industries. Of that, 3 per cent are mostly Federal lands with restricted land use classifications supported by legislation, such as national parks, national historic sites and Department of National Defence lands. The remaining 9 per cent consists of lands recognized as having special qualities. Examples include, provincial parks, protected beaches, water supply watersheds and wildlife management areas.

The *Protected and Limited Use Lands Map* will be revised periodically and will help to monitor land availability and to keep the industry informed on the multiplicity of land jurisdiction, legislation and ownership.

A Mineral Land Use Informatin Base (MINLU)

Phase 1 of the MINLU Project is proceeding well. MRLU maps are being compiled and plotted for the municipal districts of Hants west, Pictou and Halifax. The handbooks for these rural and urban municipalities are being compiled concurrently. These publications will contain information on the general geology of the area, a historical account of the exploration and mining development within the district, an annotated bibliography on resource information covering the planning area and a listing of contact people from this development.

Nova Scotia Resource Atlas

In other work carried out during this fiscal year, the land use project officer coordinated the department's submission of six mineral and energy resource theme maps, text and illustrations for the *Nova Scotia Resource Atlas*. These maps displayed the following: the geology; coal resources; peat resources; metallic minerals; industrial minerals; and offshore locations of significant oil and gas wells drilled on the Scotian Shelf. Along with submissions from other provincial agencies, this Department's contribution is a major part of a valuable publication.

LIBRARY SERVICES

The Department maintains two technical libraries. A main library is located in the Halifax office with a branch library in the Stellarton office. Holdings include more than 7000 maps, 3800 exploration assessment reports, 700 open file reports, 550 theses, 200 different periodicals, journals, and trade magazines, and numerous reference texts and other document types. The libraries function as important resource centres for information on the geology, energy resources and mining history of Nova Scotia. To this end, the libraries provide the following services and facilities:

- reference and information service to the general public, provincial government personnel, professional geoscientists, engineers and consultants in private industry;
- sale of departmental and Geological Survey of Canada publications and maps;
- catalogued and classified files of the library holdings, including exploration assessment reports, open file reports, open file maps and theses;
- a mailing list of individuals, institutions and corporations that wish to be informed of our activities and publication releases;
- facilities for photocopying, microfiche reading and printing and for making white print duplicates of maps; and
- sale of federally and provincially published topographic maps (Stellarton only).

The main library in the Halifax office continued to be busy with an increased demand for information services and products during fiscal year 1985-86. More than 1000 people (excluding staff) made use of the library facilities. In addition, 700 telephone inquiries and 900 mail inquiries were answered. A summer student was hired to assist the regular librarian and a cataloguer was hired from September to March to catalogue the backlog of books. More than 1100 documents of this backlog were catalogued. Revenue from the sale of more

than 2000 maps, 3500 pages of photocopying, 5000 pages of microfiche prints and 765 white prints of map transparencies totaled $14,139 while sale of departmental publications generated $9,196. More than 8000 publication release notices were mailed out as well as 600 copies of *Prospectives*; 400 Mineral Investment Stimulation Program (MISP) brochures 600 announcements for our annual open house and 700 annual reports. More than 500 interlibrary loans were processed and 212 orders for supplies and books were placed.

METALLIC MINERALS

Gold Resource Inventory Project

This CNSMDA funded project began in December, 1984, and will continue to the end of September, 1987. Its objective is to produce a comprehensive geologic compilation and review of the distribution and character of gold and other precious metals in the province. The project will demonstrate the diversity of geologic environments in which precious metals occur, and emphasize the economic potential of each.

The first phase of the project, a complete review of the literature on precious metals in the province, is near completion. More than 2000 references and articles have been examined. From the literature review, many occurrences of gold have been reported in the past from geologic environments that are not generally recognized today as having gold potential. The second phase of the project involves locating, describing and sampling these and other important occurrences with the aim of verifying that gold is present and describing the mineralization.

Two diamond drill holes, SL 85-1 and SL 85-2 of 1100 ft. (335 m) and 1050 ft. (320 m) respectively, were completed near Sinclair Lake, south of Goldenville, Guysborough County (11 E 1A). The holes were drilled to test for the presence of gold along the Wine Harbour anticline where there is a coincident VLF-EM conductor and a magnetic high. No visible gold was observed in the core. Assay results have not been received.

MINERAL INVENTORY

The Mineral Inventory group is responsible for the collection, verification, organization, and dissemination of mineral resources information. The main functions of the group are threefold, namely: to verify that submitted exploration assessment reports comply with the Rules and Regulations of the Mineral Resources Act for the purpose of renewing exploration licenses; to establish and maintain databases of mineral resources information; and to publish pertinent compilations of mineral resources information for use by the Department, other government agencies, the mineral exploration industry and the general public.

As a result of funds obtained from the Department, the CNSMDA, and the 1985 Provincial Summer and Fall Employment Programs, four major projects employing seven people were in operation during fiscal year 1985-86. These projects were GEOSCAN Activities, Mineral Occurrences Databases, Drillholes Database, and the Gold Bibliography.

GEOSCAN Activities.

Indexing and on-line data entry into GEOSCAN, the national bibliographic database for geological information, continued through fiscal year 1985-86 for Nova Scotia Department of Mines and Energy assessment reports, publications, open file reports, open file maps and geoscience theses. *Report 85-2 Index to Assessment Reports 1984* (with Keyword Index) and *Report 85-3 Index to Publications, Open File Reports and Open File Maps for 1984* (with Keyword Index) were published in May, 1985. New five-year (1981-1985) indexes for assessment reports and for publications, open file reports, open file maps and theses will be published in 1986.

By the end of fiscal year 1985-86, GEOSCAN contained 8314 Nova Scotia Department of Mines and Energy records, consisting of the following:

Assessment Reports	—	3,834
Publications	—	1,643
Journal References	—	1,058
Open File Reports	—	717
Theses	—	597
Open File Maps	—	465

Mineral Occurrences Databases Project

Open File Reports 606, 607 and 608, Industrial Mineral Occurrences Maps and Data Compilations were published in June 1985. Each reports consist of a 1:250 000 scale mineral occurrences location map plotted on a geological base, together with data tabulations on the mineral occurrences (compiled up to 1980) obtained from the mineral occurrences databases.

Following the publication of Open File Reports 606, 607 and 608, the Metallic and Industrial Mineral Occurrences databases were updated with new mineral occurrences and additional information on existing mineral occurrences from Nova Scotia Department of Mines and Energy assessment reports, publications and open file reports which became publically available from 1981 to the end of 1985. A Total of 154 new mineral occurrences were added to the Metallic Minerals database, for a total of 1048 metallic mineral occurrences. Fifteen new mineral occurrences were added to the Industrial Minerals database, for a total of 1057 industrial mineral occurrences.

Drillholes Database Project

All open assessment reports available up to the end of 1985 that contain drillhole information have now been coded and entered into the Drillholes database, which currently contains information on approximately 10000 drillholes, taken from more than 1800 assessment reports. Three open file reports (OFR 86-019, Central Nova Scotia, OFR 86-020, Eastern Nova Scotia, and OFR 86-021, Western Nova Scotia) have been generated from the drillholes database and will be published early in fiscal year 1986-87.

Gold Bibliography Project

Compilation of information for the gold bibliography, to be entitled *Gold in Nova Scotia: a Bibliography of the Geology, and Exploration and Mining Histories from 1832 to 1985*, is well advanced and publication is expected in fiscal year 1986-87. The bibliography will contain more than 1300 references, documenting 265 gold districts and occurrences. The bibliography will be organized into three parts: Part I will be an alphabetical author index; Part II will be an index by gold district, with each gold district being subdivided into an author index, an assessment reports index and a map and cross-section index; Part III will contain the following cross reference lists: gold district/NTS map/county, NTS map/gold district/county, and county/gold district/NTS map.

STELLARTON OFFICE ACTIVITIES

The Resource Geology Section maintains a regional office in the Department's building on Bridge Avenue in Stellarton, Pictou County. Responsibilities and activities conducted by regional office staff are listed below:

- liaison with, and monitoring of, the mineral exploration industry (with an emphasis on metallic minerals);
- supervision and operation of the drill-core library;
- in-house technical support services and equipment storage;
- maintenance of geotechnical data and samples;
- library services; and
- inventory, distribution and sales of maps and publications.

Regular, permanent staff consists of one regional geologist, one project geologist, one surveyor, two mineral technicians and a stenographer/librarian.

DRILL CORE LIBRARY

Core Storage Facilities

Core library facilities consist of three buildings erected in 1982-1983 in the Stellarton Industrial Park, one building in the Debert Industrial Park, Colchester County, one building near Malagawatch, Inverness County, and sheds and core racks at the Bridge Avenue office.

During the 1985-1986 fiscal year, 157,706 ft. (48 071 m) of drill core from more than 436 holes drilled during the years 1965 to 1986 were received for inclusion in the core library collection. Footage from these holes were stored in the Stellarton Industrial Park facility. Table 5 provides the detailed information about the drill core.

Departmental drilling programs conducted during the fiscal year contributed 11 per cent or 17,204 ft. (5 244 m) of the core received during the year. The remainder resulted from mining industry activity during the period 1965-1985. The oldest core, 10,335 ft. (3 150 m) drilled in 1965 by Mariner Mines Limited at Coxheath Hills, Cape Breton, was recovered from an abandoned field camp. The remainder of the industry core was donated by various companies, notably by Esso Minerals Canada who donated 31% of the total. The quantities of drill core from various sources are listed below in Table 6.

TABLE 6. Sources of drill core.

Source	Total feet	Total metres	Years	Percent of Total
NSDME	17,204	5 244	1985-86	11%
Esso Minerals	48,212	14 695	1973-82	31%
Mariner Mines	10,335	3 150	1965	06%
Other companies	81,962	24 982	1978-85	52%
	157,713	48 071		100%

A more detailed listing is shown in Table 6, but in some cases only approximate data is shown because of poor identification due to weathering or other deterioration, or because the detailed work of cataloguing is not yet complete. In some cases core is incomplete due to spillage, deterioration or vandalism prior to receipt.

TABLE 5. Drill core acquisitions to the core library, Stellarton for the 1985-86 fiscal year.

NTS	Company or Organization	Year Drilled	Commodity	Location	County	No. of holes	Hole Names	Core Size	Total Feet	Total Metres
11-D-13	Imperial Oil Ltd.	1973	Base Metals	Horne Settlement	Hants	4	HP-73-1 tp HP-73-14*	BQ	1,445*	440*
11-D-14	Noranda Exploration Co. Ltd.	1982	Lead, Gold, Silver	Dunbrack (Gibralter)	Halifax	1	215-1	BQ	540	165
11-E-1	Goldenville Explorations Ltd.	1983-1984	Gold	Goldenville	Guysborough	71	G-1 to G-71	BQ	24,100*	7 348*
11-E-1	NSDME Mineral Development Div.	1985	Gold studies	Sinclair Lake	Guysborough	2	SL-85-1, SL-85-2	NQ	2,100	641
11-E-2	Pan East Resources Inc.	1985	Gold	Fifteen Mile Stream	Halifax	26	85-1 to 85-25	NQ	9,695	2 955
11-E-2	Sherritt Gordon Mines Ltd.	1981	Gold	Caribou	Halifax	12	LL-81-2 to LL-81-14	NQ, BQ	7,340	2 237
11-E-2	Lake Mine Resources Ltd.	1983	Gold	Caribou	Halifax	4	LMR-83-1 to LMR-83-4	NQ, BQ	3,585	1 092
11-E-2	Golden Caribou Explorations Ltd	1983	Gold	Caribou	Halifax	4	1-83 to 4-83	BQ	538	164
11-E-3	Esso Minerals Canada	1979-1981	Lead, Zinc	Gays River	Halifax	15	298 to 328	EX, BQ	3,077	938
11-E-3	Esso Minerals Canada	1979-1982	Lead, Zinc	Gays River	Halifax	53	638 to 725, DWH	BQ, NQ	5,456	1 663
11-E-4	Imperial Oil Ltd.	1974	Base Metals	Lattes Brook	Hants	2	74-B-11, 74-B-13	BQ	230*	70*
11-E-4	Imperial Oil Ltd.	1974	Base Metals	Hennigar	Hants	1	74-B-10	BQ	280*	85*
11-E-4	NSDME Mineral Resources Div.	1985	Geology	Riverside Corner	Hants	1	RC-1-85	HQ, NQ	3,160	963
11-E-5	Imperial Oil Ltd.	1974	Base Metals	Hennigar	Hants	1	74-B-15	BQ	65*	20*
11-E-6	Imperial Oil Ltd.	1978	Lead, Zinc	Rutherford Brook	Colchester	4	RB-1 to RB-3	BQ	765*	233*
11-E-6	Imperial Oil Ltd.	1978	Base Metals	Brookfield	Colchester	2	BF-3, BF-4	BQ	348*	106
11-E-6	Imperial Oil Ltd.	1977-1979	Lead, Zinc	Smithfield	Colchester	(7)	SF-50 to SF-58	BQ	2,325*	708*
11-E-7	Imperial Oil Ltd.	1977-1978	Lead, Zinc	Glenbervie	Colchester	11	GB-15 to GB-24	BQ	1,935*	590*
11-E-7	NSDME Mineral Resources Div.	1985	Geology	Island East Riv	Pictou	1	River Road No. 2 (85)	HQ, NQ	2,067	630
11-E-9	Imperial Oil Ltd.	1974	Lead, Zinc	Sylvan Valley	Antigonish	1	SV-74-3	BQ	1,158	353
11-E-9	Imperial Oil Ltd.	1974-1975	Lead, Zinc	Addington Forks	Antigonish	1	AF-1	BQ	755	230
11-E-9	Imperial Oil Ltd.	1974-1979	Lead, Zinc	Ohio	Antigonish	21	OH-1 to OH-24	NQ, BQ	1,705*	520*

TABLE 5. Continued

NTS	Company or Organization	Year Drilled	Commodity	Location	County	No. of holes	Hole Names	Core Size	Total Feet	Total Metres
11-E-10	Imperial Oil Ltd.	1976*	ND	Limerock	Pictou	2	LR-2-76, LR-3-76	ND	590	180
11-E-10	Imperial Oil Ltd.	1977	Lead, Zinc	McLellan's Brook	Pictou	1	MB-3	BQ	213	65
11-E-10	Suncor Inc.	1984	Coal	New Glasgow	Pictou	13	AP-84-0378 — AP-84-0390	HQ, NQ	22,720	6 925
11-E-10	NSDME Mineral Development Div.	1986	Building Stone	Eight Mile Brook	Pictou	3	EMB-86-1 to EMB-86-3	BQ	338	103
11-E-10	NSDME Mineral Development Div.	1986	Building Stone	Sawmill Brook	Pictou	3	SMB-86-1 to SMB-86-3	BQ	397	121
11-E-10-11-E-14 21-H-9, 21-H-16	Esso Minerals Canada	1981-1982	Base Metals	Caribou River to Amherst	Pictou Cumberland	(26)	P-25 to P-59	BQ	4,619	1 408
11-E-11	Imperial Oil Ltd.	1974	Copper	Mt. Thom	Colchester	4	MT-49	BQ	1,663	507
11-E-12	U.S. Borax & Chemical Corp	1983	Gold, Silver Base Metals	Farmington	Cumberland	4	BF-83-1 to BF-83-3	BQ	561	171
11-E-13	Esso Minerals Canada	1980-1982	Copper	Canfield's Creek	Cumberland	(25)	P-2 to P-24, P-70, P-71	BQ	5,460	1 664
11-F-9*, 11F-16	Cominco Ltd.	1978	Base Metals	Stirling	Richmond	4	STR-78-1 to STR-78-4	BQ	1,608	490
11-F-11	Noranda Exploration Co. Ltd.	1981	Potash	Kempt Road	Richmond	1	227-2	HQ, NQ	2,163	659
11-F-12	Imperial Oil Ltd.	1973-1974	Lead, Zinc	Pomquet	Antigonish	*	PQ series	BQ	6,725*	2 050*
11-F-12	Imperial Oil Ltd.	1973-1974	Lead, Zinc	Captain's Pond	Antigonish	*	CP series	BQ		
11-F-12	Esso Minerals Canada	1979	Lead, Zinc	Meadowbrook	Antigonish	6	MDB-1 to MDB-5	BQ	580*	177*
11-F-14	NSDME Energy Resources Division	1985	Coal	Maple Brook	Inverness	2	MB-1 (85), MB-2 (85)	NQ	1 460	445
11-F-16	Noranda Exploration Co. Ltd.	1982	Base Metals	Gillis Mountain	Cape Breton	2	219-1, 219-2	BQ	587	179
11-K-1	Mariner Mines Ltd.	1965	Copper	Coxheath Hills	Cape Breton	22	MM-7 to MM-27	AX	10,335*	3 150*
20-P-13	Granges Exploration Ltd.	1985	Tin,Tungsten	Peters Lake	Yarmouth	3	K-1 to K-3	BQ	896	273
21-A-5	NSDME Mineral Resources Div.	1985	Geology	Big Tom Wallace Lake	Digby	1	Digby-1-85	HQ, NQ BQ	4,698	1 432
21-A-6	Seabright Resources Ltd. M.E.X. Explorations Ltd.	1985	Gold	Westfield	Queens	5	WF-85-1 to WF-85-5	NQ	2,113	644

TABLE 5. Continued

NTS	Company or Organization	Year Drilled	Commodity	Location	County	No. of holes	Hole Names	Core Size	Total Feet	Total Metres
21-A-10	Imperial Oil Ltd.	1978-1979	Uranium	East Dalhousie	Annapolis	59	1 to 60	BQ	8,735*	2 663*
21-A-16	NSDME Mineral Resources Div.	1985-1986	Geology	Dean & Chapter	Lunenburg	3	D&C-85-1 to D&C-85-3	NQ, BQ	2,096	639
21-H-9	NSDME Energy Resources Division	1985	Coal	Springhill	Cumberland	1	SH-99	NQ	886	270
21-H-16	Domtar Inc. (Sifto Salt Division)	*	Salt	Amherst*	Cumberland	3	SV No. 2, H5A, AMH-6	NQ, BQ	5,512	1 680
*	Imperial Oil Ltd.	*	*	*	*	1	BL-1	BQ	82	25
TOTAL									157,706	48 071

Symbols: * means subject to confirmation
() means partly received in previous year
ND means no data

Core size: NQ = $1^{7}/_{8}$ in., BQ = $1^{7}/_{16}$ in., HQ = $2^{1}/_{2}$ in. and EX = $^{27}/_{32}$ in.

More complete details of core received and on hand at the several locations may be obtained from core-library personnel. A catalogue of core in the core library facilities has been prepared and will be ready for distribution in calendar year 1986. The program of drill core acquisition from current and past diamond drilling is continuing. Currently the core library contains in excess of 1,148,293 ft. (350 000 m) of core from approximately 4,300 holes.

With funds from the CNSMDA a geologist and mineral technician were hired to carry out a program of detailed evaluation of drill core contained in the core library to ensure good documentation of corresponding data and to selectively dispose of core that has little or no value because of deterioration or repetition etc. Work during the first year of this program consisted of a detailed evaluation of approximately 52,493 ft. (16 000 m) of core obtained from the Gays River and Meaghers Grant areas of Halifax County.

The work of collecting, sorting, listing and cataloguing drill core was aided by two provincial employment programs which helped fund three assistants in the core library for a total of 45 manweeks during the summer and fall.

Funding under the CNSMDA for a fourth building in the Stellarton Industrial Park was deferred until calendar year 1986. Modifications to the first building entailed construction of a staircase to permit safer access to the storage area above the laboratory.

New equipment received during the year consisted of a 14 inch diamond saw for cutting core samples, a new set of strapping tools and a replacement vehicle for hauling core which was ordered to replace the 3.4 ton pickup truck in current use.

A departmental computer study conducted during the year identified the requirements for the core library, with acquisition of hardware recommended for calendar year 1986.

Geotechnical Data and Sample Storage

Much of the departmental collection of geological samples (rocks, soils, tills, etc.) is stored either in the Stellarton or Debert core library buildings. During the year an additional five sample cabinets, each equipped with 92 vial storage trays, were received for storing chip samples from oil and gas exploration drilling. These are located in the main office building on Bridge Avenue, Stellarton.

A large number of boxes containing miscellaneous information about the former Yava Mine were sorted and catalogued. Other assessment reports and information about mineral exploration were catalogued to increase the information base at the Stellarton office.

An assistant hired under the Fall Employment Program documented the contents of 17 boxes of miscellaneous data recovered from the Yava Mine site after closure in 1981, and sorted and filed 45 boxes of original assessment reports and seven boxes of open file reports on new shelving units purchased for long term storage of these reports.

Gold Map Compilation

The gold compilation project consisting of redrafting data onto an up-to-date 1:100 000 scale topographic and geological base was advanced during the year with the aid of a draftsman hired under the Fall Employment Program. A series of eight maps showing the entire gold-bearing Meguma zone of the mainland should be on open file in 1986.

EXPLORATION MONITORING

Monitoring of mineral exploration activity is carried out by the Resource Geology Section of the Mineral Development Division. Staff assigned to this program include a regional geologist and a project geologist based in the regional office in Stellarton.

The program of exploration monitoring provides a direct liaison with industry through which the department is able to maintain an awareness of current exploration activities throughout the Province. The monitoring process provides continuous contact with industry personnel through regular visits to company offices and exploration sites. Problems and difficulties that may need to be addressed by the Department are identified and assistance or advice is provided if necessary. In addition, the monitoring staff review assessment and other reports submitted by industry and carry out an annual statistical study of the industry as a whole for a comprehensive analysis of the general health of the exploration industry in the Province. Reports, maps, compilations and tabulations are prepared to summarize industry activity, many of which are included in the annual Mines and Minerals Branch *Report of Activities*.

TECHNICAL SUPPORT SERVICES

Map Sales. The Stellarton office is an agent for Maritime Resource Management Service (MRMS), the principal map dealer in Nova Scotia for the

Canada Map Office, Department of Energy, Mines and Resources, Ottawa. Topographic, geological and aeromagnetic maps are sold through the Resource Geology Section.

Publications Storage. Stockpiles of Department publications (reports and maps) are maintained at the Stellarton office and distributed as required.

Surveying. All diamond drillholes drilled by the Department are surveyed for location and elevation and are tied into the Land Registration Information Service (LRIS) survey monuments. Detailed data are on file at the Stellarton office. All departmental drilling and location information is compiled into an annual publication entitled *Drilling Logs of Government Core Drills* which gives a brief lithological log for each hole as recorded by the driller. Detailed geological logs are available from the geologist responsible for the drillhole. Tropari surveys of drillholes are performed by the surveyor to determine hole orientation and deviation. During the fiscal year other surveys were performed at the following locations:

- Springhill, Cumberland County — mine dump, old drillhole and Rodney mine site
- Inverness, Inverness County — to locate Algas drillholes
- Point Aconi, Cape Breton County — Brogan open pit mine
- Plymouth, Pictou County — old coal company monument
- Westville, Pictou County — Pioneer Coal Company open pit
- Penny Mountain, Colchester County — Canada Cement LaFarge Company drilling
- Oxford, Cumberland County — two holes drilled by a mining company in previous years
- Roslin, Cumberland County — location of hole drilled in 1966

Camp Support and Equipment Storage. Assistance is provided to Department personnel for inventory and storage of geological, survey and field equipment and supplies, and for setting up and closing down field camps. Transportation of equipment between offices and field camps is provided.

Other functions. Assistance and displays were provided for public awareness and educational functions and displays, including the Forestry Exhibition in Windsor, the Rockhound Roundup in Parrsboro, the Annual Meeting of the Nova Scotia Mining Society in Ingonish, the Prospectors and Developers Association Annual Meeting in Toronto and the Nova Scotia Department of Mines and Energy Open House and Review of Activities.

A collection of rocks and minerals is maintained in Stellarton for preparation of small sets of representative specimens for teachers and students. Personnel were provided to speak to classes of Elementary School children on the subject of minerals and rocks.

MINERAL EXPLORATION AND DEVELOPMENT REVIEW

Exploration Activity

The level of exploration activity in the Province during calendar year 1985 increased slightly from the previous year with total expenditures estimated at $8 million, compared to just over $7 million for 1984. Exploration for gold continues to highlight exploration activities in Nova Scotia, followed by tin, tungsten and coal. Exploration for the base metals copper, lead and zinc continues to remain at consistently low levels.

Large scale exploration programs were carried out by several companies, including Seabright Resources Inc., Suncor Inc., SCOMINEX (Scotian Mineral Exploration Venture), Durham Resources Inc. and Pan East Resources Inc. Exploration currently being carried out by Seabright Resources Inc. at Forest Hill and Suncor Inc. at Stellarton are now in a development phase of their respective programs.

New companies operating in the province include Cape Breton Sulphur and Lime Corporation, Cobequid Resources Ltd., Jascan Resources Inc., Megaflo Resources Ltd., MER Resources Inc., Mono Gold Mines Inc., Tournigan Mining Explorations Ltd. and Victoria Resource Corporation. Locations of gold and base metal explorations programs are shown on Figure 4.

Gold Exploration. Exploration for gold continued to highlight exploration activities in the Province during 1985. Interest was concentrated primarily on the historic gold-bearing quartz veins of the Cambro-Ordovician metasedimentary rocks of the Meguma Group in Halifax and Guysborough Counties. Attention is also being focused on the Cambro-Ordovician and Hadrynian volcano-sedimentary rocks of the Cape Breton Highlands, the Stirling belt in southeastern Cape Breton Island and the Antigonish Highlands in northeastern mainland Nova Scotia.

Most exploration programs carried out for gold during the year were undertaken by junior companies, although interest from the major companies has been increasing. A moderate increase in the level of gold exploration was recorded in calendar year 1985 over the previous year.

FIGURE 4. Locations of private sector gold and base metal exploration projects.

Seabright Resources Inc. continued a large-scale exploration program on their Forest Hill property in Guysborough County, consisting of geological mapping, geochemical and geophysical surveys, trenching and diamond-drilling. An exploration shaft was started on the property to carry out underground testing of ore grade mineralization following an earlier announcement in the year of a significant gold discovery. The company completed a detailed drilling program at Lake Catcha, Halifax County and at year end was undertaking a large drilling program at Beaver Dam, Halifax County. Seabright also continued a detailed feasibility study on recovering gold from old tailings sites throughout the Province.

Pan East Resources Inc. resumed work on several gold properties including geophysical surveys and a large diamond drilling program at Fifteen Mile Stream, Halifax County, and two small drilling programs at Killag Mines, Halifax County and Mount Uniacke, Hants County.

SCOMINEX (Scotian Mineral Exploration Venture), under an option agreement with Northumberland Mines, carried out additional drilling on Northumberland's Goldenville and Cochrane Hill properties in Guysborough

County. A small drilling program was also carried out by SCOMINEX at Molega, Queens County and regional reconnaissance surveys for gold were conducted in the Antigonish Highlands, the Cape Breton Highlands and in the Stirling belt in southeastern Cape Breton Island.

Other drilling programs were undertaken by Onitap Resources Inc. at Goldboro, Guysborough County, Acadian Gold (Mines) Ltd. at Beaver Dam, Halifax County, and Durham Resources Inc. (Toronto) at Wine Harbour, Guysborough County. BP Resources Canada Limited carried out a small drilling program for gold and base metals near Cheticamp, Inverness County, as well as a detailed surface exploration program consisting of geochemical and geophysical surveys, geological mapping and prospecting. A detailed drilling program was recently completed by Bear Pass Resources Corp. at Pleasant River Barrens, Lunenburg County. MER Resources Inc. carried out an exploration program for placer gold along the Atlantic coast consisting of detailed sampling of beach sands and an offshore drilling program. Megaflo Resources Ltd. conducted a detailed overburden drilling in the Faribault Brook area east of Cheticamp, Inverness County.

Small-scale surface exploration programs were carried out by several other companies throughout the Province during 1985. Geochemical and geophysical surveys were undertaken by Coxheath Gold Holdings Limited at Gold River, Lunenburg County. Similar programs, including trenching, were carried out by Jascan Resources Inc. at Gold Lake, Halifax County and Victoria Resource Corporation at Mill Brook near Forest Hill, Guysborough County. Tournigan Mining Explorations Ltd. conducted geochemical and geophysical surveys in the Faribault Brook area east of Cheticamp, Inverness County, and Gold Brook Developments Ltd. continued several projects in the Cape Breton Highlands.

Other programs included an examination of some of the old working at the Leipsigate gold property in Lunenburg County by Meguma Gold Corporation Limited and underground bulk sampling by Mr. E. Horne at Renfrew, Hants County. Noranda Exploration Company Limited conducted regional reconnaissance surveys for gold and base metals in eastern mainland Nova Scotia and Cape Breton Island.

Base Metals Exploration. Exploration for base metals during 1985 continued to be dominated by the search for tin and tungsten in the Devono-Carboniferous granitic intrusives of western and central mainland Nova Scotia. Following the discovery of the East Kemptville tin deposit by Shell Canada Resources Limited in 1980, several companies have continued extensive exploration programs concentrating primarily on the granitic intrusives of the South Mountain Batholith in Shelburne and Yarmouth Counties and Musquodoboit batholith in

Halifax County. The level of exploration activity for these commodities dropped slightly from the moderate levels recorded in 1984 with the majority of the work carried out by major companies.

Rio Algom Limited continued to assess their current ground holdings in the East Kemptville area and carried out a small exploration drilling program near the East Kemptville tin deposit. On optioned ground southwest of the East Kemptville deposit Granges Exploration Ltd. carried out an exploration program for the tin and tungsten consisting of geochemical and geophysical surveys, geological mapping and diamond drilling.

Kidd Creek Mines Ltd. continued a detailed exploration program for tin and tungsten in the Tangier Grand Lake area consisting of geochemical surveys, geological mapping and trenching. The company also carried out additional work on properties in the Kempt Snare Lake area, Yarmouth County consisting of geochemical and geophysical surveys and geological mapping. Smaller programs for tin and tungsten were undertaken by Seabright Resources Inc. in the Tusket area, Yarmouth County and by Acadia Mineral Ventures Limited in the Sloan Lake area, Yarmouth County.

Exploration for the traditional base metals copper, lead and zinc continued at significantly reduced levels as compared with previous years. The level of exploration activity dropped moderately in 1985 from that during 1984 with few companies actively engaged in this sector of exploration.

BP Resources Canada Limited continued a small program of geological mapping and geochemical surveys on properties in the Havre Boucher area, Antigonish County, and in the Stewiacke River Valley area, Colchester County. Bigstone Minerals Ltd. carried out additional geophysical surveys on the Stirling property, Richmond County and Acadia Mineral Ventures Limited continued work on properties in the Bridgeville area, Pictou County.

A detailed exploration program for antimony was undertaken by Durham Resources Inc. (New Brunswick) at West Gore, Hants County. The company carried out geochemical and geophysical surveys and a large diamond drilling program.

Coal Exploration. Exploration for new coal reserves in the province continued at roughly the same level of activity in 1985 as in 1984. Exploration programs were carried out both by government and industry.

The Nova Scotia Department of Mines and Energy continued an assessment of the exploration potential for coal in several areas of the Province including Springhill, Cumberland County and Port Hood, Inverness County.

Suncor Inc. continued a detailed exploration program for coal at New Glasgow and Stellarton, Pictou County, consisting primarily of a large diamond drilling program and downhole geophysics. Athol Exploration Inc. carried out a preliminary evaluation of the exploration potential of the Springhill coalfield.

Barite Exploration. Exploration levels for barite continued to decline in 1985, with only minor activity during the year. Mr. Gerald Logan carried out prospecting and trenching on a barite property at Middle Stewiacke, Colchester County and Mr. John Leslie conducted geochemical and geophysical surveys for barite in the Tennycape area, Hants County.

Mining Development.

Development work was undertaken on several projects throughout the Province during 1985. Commodities under current development include gold, tin and coal.

Seabright Resources Inc. initiated development work on its Forest Hill gold property in Guysborough County and is now constructing an 850-foot exploration shaft. The company plans to carry out a detailed underground examination of significant new gold reserves outlined in a recent diamond drilling program.

Development work on the East Kemptivlle tin deposit owned by Rio Algon Limited has continued on schedule and initial production from the open pit mine started in mid-October.

The Cape Breton Development Corporation continued development work on several projects in the Sydney coal basin during 1985. Development work was carried out on the Phalen Mine at New Waterford, the Donkin Mine at Donkin and the No. 1B Collier (Phalen seam) at Glace Bay.

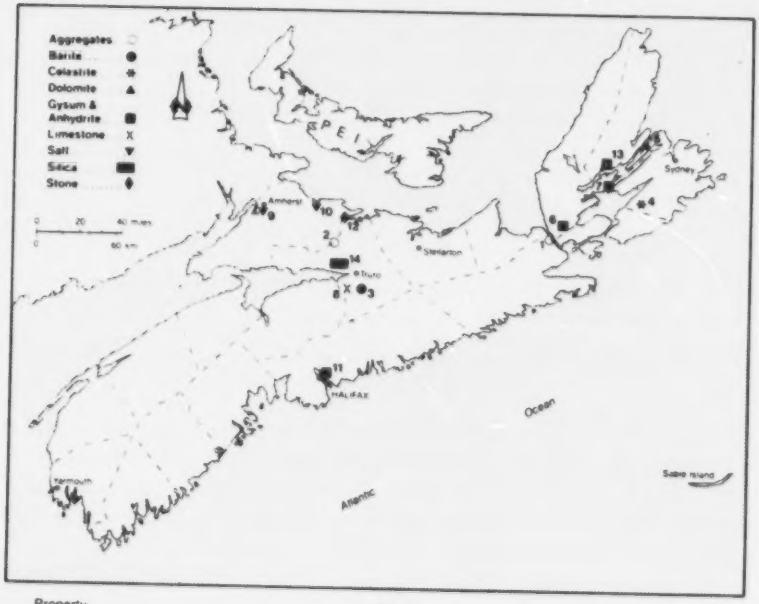
Suncor Inc. is continuing feasibility studies on the development of mineable coal reserves in the Pictou coal basin near Stellarton with the continuation of a detailed drilling program. Pioneer Coal Company also continued development work on its coal operations at Westville, Pictou County with a detailed drilling program to extend current production to a new pit.

Industrial Minerals Industry Review

Industrial mineral activity during the year continued at a high level with production value for 1985 above that of 1984. Excluding aggregate production, there were 18 industrial mineral producers operating at 25 sites producing ten commodities including anhydrite, barite, clay and shale, dolomite, gypsum, limestone, salt, silica sand, building stone and peat moss. The Province's

numerous aggregate producers operating in both granular and bedrock aggregate deposits supplied all provincial requirements, with two companies supplying aggregate materials to developing export markets nationally and internationally.

Along with production, industrial mineral activity by industry included exploration and development programs, production expansion programs and market studies. Many of these programs involved information and technical assistance provided by the Mineral Development Division of the Department of Mines and Energy. Figure 5 shows the locations of industrial mineral development.



Property	Activity
1 Construction Aggregates Ltd	aggregate exports to U S A
2 Permanent Concrete Ltd	aggregate exports to several Eastern Canadian markets
3 Nystone Chemical Ltd	drill mud barite production
4 Timminco Ltd	feasibility study for developing MacRae celestite deposit
5 Scotia Limestone Ltd	development agreement for expanded dolomite marketing with Mosher Limestone Ltd
6 Georgia Pacific Corp , Bestwall Division	quarry development continued
7 Little Narrows Gypsum Co Ltd	production from the new McAulay Quarry began
8 Canada Cement Lafarge Co Ltd	evaluation of several high CaO limestone deposits
9 Sifto Salt Division, Domtar Chemicals Group	plant modernization near completion
10 Canadian Salt Company Ltd	underground development underway
11 National Gypsum Canada Ltd	completion of marine terminal loading facility
12 Wallace Quarries Ltd	stone production for restoration projects
13 Republic Gypsum Company	feasibility study of gypsum quarry development
14 Nova Scotia Sand and Gravel Ltd	new silica sand quarry in operation

FIGURE 5. Location of private sector industrial minerals exploration and development projects.

Aggregate. Aggregate production remained steady during the year with production volumes up slightly for 1985. Exports have increased substantially over those of previous years, attributed to shipments to the southern United States and Prince Edward Island by Construction Aggregates Ltd. at Mulgrave, Guysborough County and by Permanent Concrete Ltd. at Folly Lake, Cumberland County which shipped aggregate materials to Prince Edward Island and railway ballast to New Brunswick and Quebec. The most significant development was Construction Aggregates Limited expansion of aggregate exports to several United States markets along the Eastern Seaboard and to Houston, Texas.

Barite. Nystone Chemicals continued operation of its barite quarry at Brookfield, Colchester County, and its plant at Debert, Colchester County, to produce USP pharmaceutical grade barite. Nystone also completed the production of a 10,000 ton (9 072 t) order of drill mud grade barite.

At Scotsville, Inverness County, Scotsville Mineral Resources mined and crushed barite ore in preparation for its jig plant, which was operated for a short period in 1985.

Celestite. On November 1, 1985, Timminco Limited of Toronto was issued a special license on 19 claims containing the MacRae celestite deposit at Enon, Cape Breton County. Timminco produces and markets a broad range of ferrous and non-ferrous metals for the steel, aluminum, automotive, aerospace and atomic energy industries in North America, Europe and the Pacific rim countries.

Timminco has proposed to spend more than $100,000 on the property during the first year of the license and has obtained a bulk sample from the deposit for analytical and metallurgical tests.

Timminco has also acquired the mineral rights to a second celestite deposit at Beckwith, Cumberland County and has obtained a bulk sample from this deposit as well.

Diatomite. In 1985 interest in the Province's diatomaceous earth deposits continued. Numerous occurrences are known in the Cobequid Mountain region of northern Nova Scotia and along the North Mountain region of Annapolis and Digby Counties. Although no production ensued, deposits in the New Annan district of Colchester County were sampled and assayed by Mr. Harold Crossman for use as a filler and as a pozzolan.

Dolomite. The development of the Kelly Cove, Victoria County dolomite deposit in 1984-85 by Scotia Limestone Ltd. sparked additional interest in Cape Breton dolomite. Recently Mosher Limestone Ltd. obtained an agreement allowing the company to obtain dolomite from this deposit to supply the soil conditioner market and other possible markets.

Kelrock Ltd. is examining the filler potential of their dolomite deposit located at Cape Dauphin, Victoria County. Fillers and extenders are now used extensively in paper, plastics, paint and rubber, and in caulking compounds and sealants.

Graphite. At Glendale, Inverness County, Mr. Tony Barrett has completed a preliminary exploration program on a graphite occurrence. This program consisted of sample assay work, trenching and a geophysical survey to delineate ore reserves.

Gypsum. Georgia Pacific Corporation continued development work on their gypsum property at Sugar Camp, Inverness County (7 miles (11.3 km) north of Port Hawkesbury). Present plans are to begin production at this site in 1987. Construction began on a new haul road from this deposit to link up with Highway No. 4. When production begins, trucks will be used to haul gypsum from the deposit to the Georgia Pacific marine terminal at Point Tupper.

At Little Narrows, Victoria County, Little Narrows Gypsum Company Ltd. continued to develop another gypsum deposit northeast of the present quarry. Approximately 43,000 tons of gypsum were quarried from this site for productivity analysis purposes.

Republic Gypsum Company of Dallas, Texas completed a diamond drilling program on its gypsum deposit at Plaister Mines, Victoria County. This drilling was done to delineate gypsum reserves and was part of an overall feasibility study to examine the possibilities of establishing a gypsum wallboard plant on Cape Breton Island to supply United States Eastern Seaboard markets.

Nova Construction Limited of Antigonish began a resource evaluation program including diamond drilling on a gypsum deposit at Brierly Brook, Antigonish County.

Gypsum for agricultural use is now available from Mosher Limestone Company Ltd. of Upper Musquodoboit. Gypsum contributes calcium and sulphur to the soil and has little or no effect on soil pH. It also breaks up heavy clay soils.

Limestone. Canada Cement LaFarge Ltd. completed a second-phase diamond drilling program on several high calcium limestones in Colchester County. Canada Cement is assessing the results of this exploration program.

Salt. Domtar Chemical Group, Sifto Salt Division completed a production modernization program at its Nappan, Cumberland County plant using federal financial assistance provided through an Atlantic Energy Conservation Investment Program (AECIP). Installed and now operational is a state of the art salt production plant known as a mechanical vapour recompression evaporating process system. This new plant, the first of its kind for salt manufacture in North America, allows Sifto to produce high-purity salt products much more efficiently.

Construction work was underway to upgrade the higway leading from Pugwash to the Trans Canada Highway. This upgraded road will allow The Canadian Salt Company to increase the weight of truck shipments.

Silica. Scotsville Mineral Resources has completed preliminary work consisting of trenching and sampling of its silica property at Chegoggin Point, Yarmouth County.

Nova Scotia Sand and Gravel bulk sampled their silica sand deposit at Elmsvale, Halifax County for production tests at its plant at Sandy Desert, Hants County.

Stone. In response to the need for replacement blocks for the restoration of Province House by The Southwestern Stone Cleaning & Restoration Co. Ltd., the Wallace Quarries Ltd. sandstone quarry at Wallace, Cumberland County was opened for a short time to supply the required stone for this project.

ENERGY BRANCH

J. R. Hornby, P.Eng.
Assistant Deputy Minister

Nova Scotia is heavily dependent on petroleum for its everyday needs. Approximately 62 per cent of its primary energy comes from petroleum, most of which is imported from foreign sources.

The provincial government has established a clear objective to reduce this dependence by developing Nova Scotia's indigenous energy resources, by gaining access to Canada's energy resource base, by improving the efficiency of energy use.

The mandate of the Energy Branch is to initiate and implement policies and programs to achieve the government's energy goals. The Branch consists of two divisions — Energy Resources and Energy Management. The Energy Resources Division focuses on the development of Nova Scotia's indigenous resources, particularly oil and gas primarily in the offshore area and coal and peat. The Energy Management Division focuses on the acquisition of energy from outside the province and the utilization of energy within the province.

ENERGY RESOURCES DIVISION

A. G. Batcup, P. Eng., Director

INTRODUCTION

The Energy Resources Division is accountable for the effective evaluation, promotion and regulation of Nova Scotia's energy resources. The Division's activities are primarily concerned with the two main hydrocarbon resource sectors: petroleum (oil and gas) and coal/peat.

During the 1985/86 fiscal year the Division's activities were strongly influenced by events offshore Nova Scotia, in Canada and on the international energy scene.

- With regard to Nova Scotia, in July, 1985, the Venture Gas Project partners submitted an Export Application to the National Energy Board. In early 1986, two highly significant exploration discoveries were made offshore, namely the North Triumph natural gas field and the Cohasset oil field. Onshore, encouraging exploration results in the Pictou coalfield brought Suncor Inc.'s underground coal mine closer to development.
- On the national scene, in October, 1985, the federal government announced its new frontier energy policies, replacing the National Energy Program. These policies are to be implemented through the proposed Canada Petroleum Resources Act and have important implications for the Canada-Nova Scotia Offshore Agreement and exploration incentive grants.
- On the international stage, in December, 1985, and early 1986 world oil prices declined dramatically from U.S. $29 per barrel to a low of below U.S. $10 per barrel. At the time of writing, the price had recovered slightly to U.S. $14, but the impact of the sharp fall has already been felt by both the petroleum industry and the coal community.

The influence of these events can be detected in the key activities performed by the Division during the year. The Petroleum Resources Section was heavily involved in providing analytical support for the negotiation of a new offshore agreement with the federal government. In addition, to ensure future exploration activity in the short and medium term, notwithstanding lower oil prices, the Petroleum Resources Section was actively involved in renegotiating onshore and offshore exploration agreements with various oil companies. The Section also played a lead role in designing the Call for Land Nominations issued by the Canada-Nova Scotia Offshore Oil and Gas Board in February, 1986.

The Coal Resources Section was similarly active in promoting the Province's coal and peat resources. Technical information and assistance was provided to Suncor Inc. in connection with Pictou project. A potential investor in the Province's fuel peat resources was identified, and discussions began that, hopefully, will result in the establishment of a fuel peat demonstration project in the province. The Coal Section also organized a successful conference entitled Coal Development in Nova Scotia in May, 1985, and produced a widely praised publication on Nova Scotia's coal resources during the year.

Petroleum Resources Section

C. Andrew Parker, P. Eng., Manager

INTRODUCTION

The Petroleum Resources Section is responsible for monitoring, evaluating and regulating petroleum exploration and development activities onshore and, in conjunction with the Nova Scotia office of the Canada Oil and Gas Lands Administration (COGLA), offshore Nova Scotia.

Throughout the fiscal year 1985/86, the Section's efforts were directed mainly towards monitoring and evaluating offshore exploration and development activities.

- Despite a decrease in the number of active rigs offshore, a significant exploration program was still maintained, primarily in the Sable Island area.
- A number of first round exploration agreements expired, and second round agreements were negotiated by governments and industry. The Canada-Nova Scotia Offshore Oil and Gas Board issued a Call for Nominations for all Crown lands offshore Nova Scotia.
- Progress was made on the Venture Gas Project. Additional drilling was undertaken to firm up the reserves, and applications were made to regulatory authorities to export the gas from the Venture Gas Project to the United States.
- Regulations governing onshore oil and gas exploration and production activity were put in place during the fiscal year 1985/86 and provide an attractive fiscal regime that should encourage onshore exploration activity. Negotiations were undertaken with onshore licence holders under these new regulations.

OFFSHORE EXPLORATION AND DEVELOPMENT

Early in 1986 the provincial and federal governments negotiated 11 second-round offshore exploration agreements with oil and gas companies. These exploration agreements, which cover an offshore area of 3,918,852 acres (1 585 959 ha), were reviewed by the Petroleum Resources Section. They represent the start of a second generation (or "round") of exploration agreements offshore Nova Scotia. A summary of these agreements is presented in Table 7 and Figure 6.

Table 7. Second Round Exploration Agreements (EA) Negotiated During 1985-86 Fiscal Year

EA Description	EA Number (1)	(2)	Area (Acres)	Area (Hectares)
1. Shell-Slope	273	(109)	926,096	374 791
2. Shell-Shelf	275	(118)	319,372	129 250
3. Shell-Shelf	276	(120)	257,438	104 185
4. Shell-Shelf	277	(122)	440,729	178 363
5. Shell-Shelf	278	(124)	376,390	152 325
6. Mobil-East Banquereau	280	(147)	670,262	271 255
7. Dome/Inco-East Sable	281	(150)	298,362	120 747
8. Petro-Canada/ Canadian Superior-Shelf	284	(258)	211,268	85 500
9. Petro-Canada-Banquereau	285	(259)	179,899	72 805
10. Onaping/Scotia Energy-Chebucto	286	(260)	115,320	46 670
11. Texaco-Albatross	287	(263)	123,716	50 068
TOTALS			3,918,852	1 585 959

[1]Second Round EA number
[2]First Round EA Number

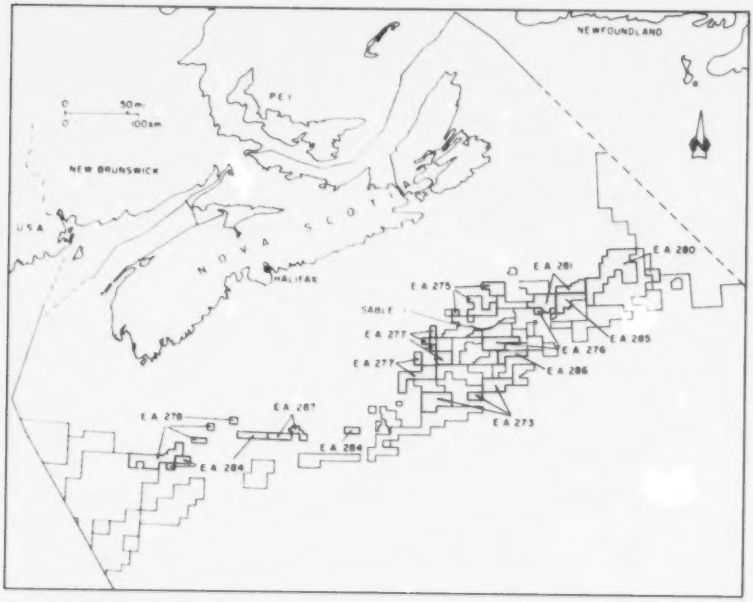


FIGURE 6. Location of second round exploration agreements.

During fiscal 1985/86, the Section and COGLA worked together to develop terms and conditions for the first Call for Nominations, offshore Nova Scotia. The Call, issued in February, 1986, requested industry to formally indicate to the Canada-Nova Scotia Offshore Oil and Gas Board which Crown lands it would be interested in acquiring offshore.

The final land relinquishments resulting from the first round of exploration agreements occurred during the fiscal year. Staff were involved in discussions leading up to the relinquishment of 527,507 acres (213 482 ha) of land on Mobil's Sable Island block. Land covered by five other exploration agreements also was returned to the Crown (see Figure 7).

The level of drilling activity for the 1985/86 fiscal period continued at a steady pace. During this period, 10 wells were spudded (three of which were drilling at the end of the fiscal year) and 14 wells were completed (including seven begun in the previous year). The 14 wells completed included nine exploratory wells, four delineation wells and one relief well. Of the nine exploratory wells completed, three wells, West Venture N-91, West Olympia 0-51 and North Triumph G-43 were gas and condensate discoveries. All four

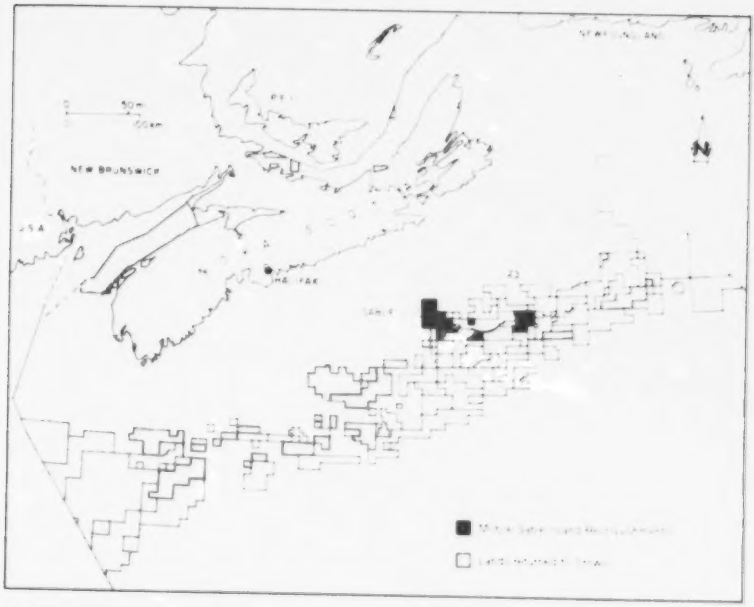


FIGURE 7. Location of lands returned to the crown.

delineation wells drilled were successful. The Alma F-67, Thebaud I-93 and North Triumph B-52 wells were successful in delineating their respective gas structures, while Cohasset A-52 confirmed oil reserves in the Cohasset structure where oil was first discovered in 1973 (locations on Figures 8 and 9).

Mobil's West Venture N-91 well, which encountered well control problems in September, 1984, was successfully controlled and abandoned in June, 1985. The Section, with COGLA, carefully monitored the situation throughout and reviewed the operator's well control proposals. A member of the Section's staff served on the board of investigation, which examined the cause of the incident and released its results in a final report in April, 1985.

In October, 1985, the federal government announced a new frontier energy policy to replace the National Energy Program, and staff participated in assessing the impact of this policy on future exploration activities off Nova Scotia.

The governments of Nova Scotia and Canada began negotiations regarding changes to the Canada-Nova Scotia Agreement on Offshore Resource Management and Revenue Sharing. These negotiations were prompted by

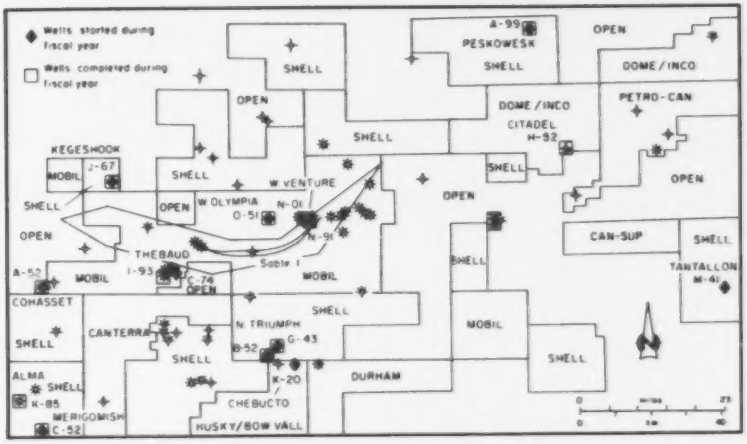


FIGURE 8. Exploration well locations around Sable Island.

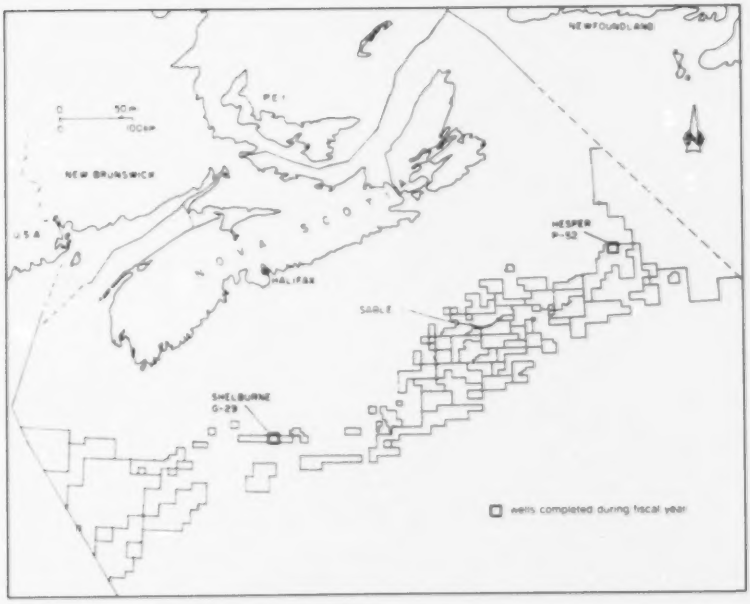


FIGURE 9. Exploration well locations.

changes in federal energy policies and by federal-provincial energy accords reached during the year with Newfoundland and the western producing provinces. Staff provided analyses to Nova Scotia officials involved in these negotiations, which were continuing at year end.

Other Related Activities

The Section completed an economic analysis of various gas and oil production systems and, in conjunction with COGLA, analyzed the implications of developing other gas fields in conjunction with the Venture Gas Project reserves. The Section initiated a study of significant offshore prospects to provide an improved definition of reserves, further drilling requirements and appropriate development methods for each project.

Staff compiled and updated a variety of summaries, maps and tables on offshore activity, which were made available for internal and public use. A map showing information on existing offshore exploration agreements was compiled and made available to exploration companies interested in the Call for Nominations. Display materials were prepared for the Section's participation in the 1985 Canadian Offshore Resources Exposition (CORE) and the 1985 Department of Mines and Energy Annual Open House. A number of presentations were given to public schools and educational institutions.

The Section produced a publication entitled *Nova Scotia Oil and Gas Report 1985*, which reviewed offshore and onshore petroleum activities during the past year. The Section also provided assistance in the preparation of a revised Department publication, *An Introduction to the Offshore*, which provides basic information on the offshore for use in the public school system.

The Section contributed funds to, and monitored the progress of, a research and development project aimed at improving offshore rig evacuation techniques [Preferred Orientation and Displacement (PROD) SystemÇ in cooperation with the governments of Canada and Newfoundland and the oil industry.

Staff were active on the following industry and government committees:

- Canadian Petroleum Industry Training Society Course Examination and Certification Committee
- Environmental Co-ordinating Committee
- Sable Island Environmental Advisory Committee
- Sable Island Management Committee
- Venture Project Development Review Committee
- Frontier Geoscience Technical Advisory Committee
- Canadian Standards Association Steering Committee for Offshore Structure Standards

ONSHORE EXPLORATION ACTIVITY

During the fiscal year 1985/86 a new set of regulations were prepared under the Petroleum Resources Act. These regulations are designed to encourage activity and protect provincial interests. In October, 1985, the regulations were promulgated. All former licence holders were allowed six months to renegotiate their exploration agreements. These negotiations are nearing completion at the time of writing. No onshore petroleum wells were drilled and no licences issued. Regulations governing coal gas extraction were developed and have reached the final draft stage.

The Section continued to collate data concerning onshore petroleum shows, wells and geophysical information. Final reports containing this information are nearing completion and will be made available to all potential explorers.

Coal Section

C. E. Bain, P. Eng., Manager

INTRODUCTION

The Coal Section in the Energy Resources Division is comprised of two groups: Coal Exploration and Coal Development. Locations of projects are shown in Figure 10.

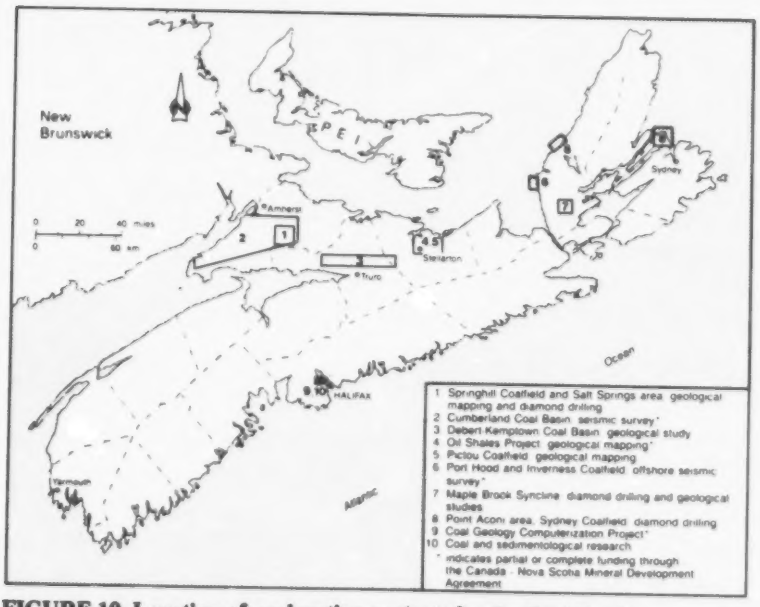

New Brunswick
PEI
Amherst
Truro
Stellarton
Sydney
HALIFAX
Yarmouth
Atlantic Ocean
0 20 40 miles
0 60 km
1 Springhill Coalfield and Salt Springs area: geological mapping and diamond drilling
2 Cumberland Coal Basin: seismic survey*
3 Debert-Kemptown Coal Basin: geological study
4 Oil Shales Project: geological mapping*
5 Pictou Coalfield: geological mapping
6 Port Hood and Inverness Coalfield: offshore seismic survey*
7 Maple Brook Syncline: diamond drilling and geological studies
8 Point Aconi area, Sydney Coalfield: diamond drilling
9 Coal Geology Computerization Project*
10 Coal and sedimentological research
* indicates partial or complete funding through the Canada - Nova Scotia Mineral Development Agreement

FIGURE 10. Location of exploration projects for the Coal Section.

The objective of the Coal Exploration group is to assess the coalfields of Nova Scotia to determine the availability, quantity and quality of underground and surface deposits of coal. This group collects and analyzes field program data and provides technical assistance in coal exploration and development matters to industry and to other government departments. A successful example of this type of activity is the Suncor program in the Pictou coalfield in which one of the factors attracting the company to the area was the work carried out by the Coal Exploration group. Section staff have continued to work closely with Suncor during their exploration and mine planning activity.

The goal of the Coal Section is to encourage and coordinate the development and efficient use of coal, coal products and peat. Specific activities within this mandate include:

- monitoring demand for coal within the province and encouraging its use as a substitute for imported fuels;
- monitoring international developments in coal conversion and utilization technologies and determining their relevance to Nova Scotia;
- assessing and monitoring coal supply with a view to identifying new coal mining opportunities;
- assessing proposals from private sector coal exploration programs; and
- preparing coal and peat development and utilization policies.

Both groups are very conscious of the need to promote investment in the Province's coal resources. In May, 1985, the Section organized a conference in Halifax entitled Coal Development in Nova Scotia. The conference was attended by more than 100 delegates from inside and outside Canada. A publication entitled *Coal In Nova Scotia*, on Nova Scotia's coal resources was released and distributed at the conference and to mining companies throughout Canada.

In summary, the role of the Coal Section is to explore, evaluate and promote the development and use of the coal resources within the province.

DEVELOPMENT AND UTILIZATION

The future of coal, which is one of the province's most important resources will depend on the development of new uses and the introduction of optimum mining, processing, handling and transportation systems. The Coal Section monitors research and development activity related to coal utilization to evaluate its application to the Nova Scotian coal industry. The Section is involved in various research projects within the province including, for example, coal liquefaction, fluidized-bed combustion and coal-liquid mixtures.

On an ongoing basis, the Coal Section analyzes barriers to coal utilization and directs research toward solving them. Coal transportation, blending facilities, optimum use of existing infrastructure, cost-effective means of reducing combustion emissions and market competition with alternate fuels are just a few of the issues being addressed by the Department.

Coal-Related Research

The Coal Section continued its involvement through 1985 in the project to "Assess and Develop the Beneficiation Potential of Eastern Canadian Coals". This program is being carried out under the auspices of the Committee on Atlantic Coal with funds provided through Energy, Mines and Resources Canada's Coal Utilization Program (Table 8). This year, Phases 6 and 7 of this project were completed and Phases 8 and 9 started. Phase 5 assessed the benefits of using beneficiated coal in new and existing plants for thermal generation. In Phase 7, coal from the Prince mine was tested at the EPRI multi-circuit coal preparation plant in Homer City, Pennsylvannia. Coals from the Prince mine, the Donkin-Morien development and the Salmon Harbour seam (New Brunswick) were tested at the Alberta Research Council's coal preparation pilot plant in Devon, Alberta. Combustion tests on the clean coal and the rejects have been done by Combustion Engineering in Windsor, Connecticut and by the CANMET laboratories of Energy, Mines and Resources Canada. In Phases 8 and 9 of this program, the information from previous phases will be reviewed and summarized to determine the optimum beneficiation methods and rejects utilization for eastern Canadian Coals. The results will be presented in a final report and at a public seminar in the fall of 1986.

Committee on Atlantic Coal

The Committee on Atlantic Coal (CAC), established in 1982, brings the scientific expertise from diverse institutions in the Atlantic provinces to bear on specific problems related to the mining and utilization of coal. The CAC also and facilitates communications between the industry and the research and development community.

Effective April, 1985, the funding that the Committee had received from the National Research Council was terminated. New sources of funding are being pursued. In the meantime, unsolicited proposals are being submitted to Supply and Services Canada.

Coal Liquefaction. The Department of Mines and Energy continued to fund the coal liquefaction research program at the Nova Scotia Research Foundation Corporation (NSRFC) laboratories in conjunction with Energy, Mines and

Resources, Canada. Extensive test work on two-stage direct liquefaction commenced in 1985 at NSRFC with the objective of developing a process suitable for Nova Scotia coals that can sustain high liquid yields (approximately five barrels per ton of coal). Thermal/catalytic and catalytic/ catalytic processes are being tested with several catalysts and three Nova Scotia coals: Prince, Lingan, and Donkin- Morien. This research program, which will continue until September, 1987, will identify the most reactive coal and the relative merits of various two-stage process configurations.

TABLE 8. Beneficiation Potential of Eastern Canadian Coals — Project Phases

1. Data Bank on Atlantic Coals

   — Collect all existing data on chemical and physical characteristics.

2. Determine Additional Properties of Raw Coals that will affect Beneficiation.

   — Review all coal research and development work currently being done in Atlantic Canada
   — Identify additional information required
   — Identify performers and
   — Contract out specific projects to provide required additional information

3. Synthesis of all Data From 1 & 2.

   — Present available data from all major coal seams in similar format
   — Prepare all data for computerization and
   — Run data for computer predictions of plant performance to determine the degree of upgrading possible by a variety of conventional washing techniques.

4. Identify all existing Coal Preparation Operations in Eastern Canada.

   — Present present use and
   — Show optimum future use.

5. Assess the Technical, Economic and Social Benefits of Utilizing Beneficiated Coal for Thermal Generation

6. Select Specific Eastern Canadian Coals for Extensive Testing in a Pilot Plant Program.

   — Select representative samples of coal based on 1, 2 & 3 above and
   — Ship appropriate tonnages to pilot plant.

7. Test Selected Coals in a Multi-Circuit Pilot Plant (Homer City, PA).

   — Review results carefully for follow-up and
   — Assess the potential of rejects utilization.

8. Determine the Optimum Beneficiation Techniques for East Canadian Coals based on Pilot Plant Tests.

   — Technically (best results)
   — Economically (least cost) and
   — Rejects utilization (best possibilities).

9. Complete Economic Analysis of Results.

   — Determine optimum size of plants required
   — Locations
   — Capital and operating costs and
   — Rejects utilization.

10. Final Report to Committee on Atlantic Coal.

    — Evaluate program and
    — Recommend follow-up action.

Coal Liquid Mixtures. During the 1985/86 fiscal year, research on two coal liquid fuel projects was funded through the Canada-Nova Scotia Oil Substitution and Conservation Agreement.

The research projects were:

- Rheology and Spray Testing. This program, being conducted at NSRFC, is designed to set up testing facilities to determine the specifications of various coal liquid fuels and how these specifications can be modified to make the fuels more compatible with user needs and facilities. At present there are no such testing facilities for coal liquid fuels in Canada.

- Determination of Optimum Ash. This study is currently being conducted at the Centre for Energy Studies. Its purpose is to determine the corrosion and erosion effects of coal liquid fuels with various ash levels on boiler tubes and heater surfaces. It is hoped that this study will identify a coal liquid fuel with an acceptable ash level that may eventually be used in a utility boiler.

Fluidized Bed Combustion. A study to determine whether Nova Scotian coals can be economically utilized in a 150-megawatt, commercial scale, circulating fluidized bed unit was funded under the Oil Substitution Agreement and is being conducted by Nova Scotia Power Corporation.

COAL EXPLORATION

In 1985 the Coal Section continued its evaluation of the province's coal resources and maintained liaison with private companies engaged in the exploration and mining of coal. Several of its projects were funded under the Canada-Nova Scotia Mineral Development Agreement, including the federally funded Coal Database and Seismic Surveys programs and the provincially funded Oil Shale Assessment.

Coal Data Base

The Coal Section, in cooperation with the Institute of Sedimentary and Petroleum Geology of the Geological Survey of Canada has initiated a three-year project to develop a comprehensive data base of geological and analytical information on Nova Scotia's coalfields. Core and outcrop descriptions, geophysical logs of boreholes, mine plans, coal analyses, topographic maps and bathymetric maps provide data that will be compiled in a computer-processable format.

During 1985/86, the first year of the project,entry and verification of all borehole data and some of the analytical data for the Sydney and St. Rose coalfields were completed. As well, topographic and bathymetric maps for the Sydney coalfield were digitized.

Seismic Surveys

Five miles (8 km) of shallow seismic reflection surveys were conducted at several locations in the Cumberland Basin. The surveys were trial runs to determine the seismic transmission characteristics of the basin strata.

High-resolution reflection seismic lines were run in the submarine extensions of the Port Hood and Inverness coalfields to determine the structural character of these fields. There were 16 miles (26 Km) of seismic run at Port

Hood and 54 miles (87 Km) at Inverness. The results of this survey will be available early in 1986.

Oil Shale Assessment

Evaluation of the oil shales of the province began in 1985 with an examination of the oil shales of the Stellarton Basin in Pictou County.

The purpose of the project is to aid in the development of an information base on the geology of Nova Scotian oil shales. The creation of this information base is seen as a necessary first step in allowing a comprehensive assessment of Nova Scotian oil shales utilization potential. In addition, oil shale has application in fluidized bed combustion and as a geological indicator of associated coal deposits.

The scope of the project involved both field and laboratory work. The goals of the field examinations were to (1) document the number and location of the oil shales within the basin, (2) examine in detail the lateral changes in oil shale thickness, and (3) use the sedimentology of the oil shales and associated lithologies to aid in reconstructing the oil shales depositional setting.

Laboratory examination of the oil shales involved (1) testing for hydrocarbon yield using both Rock-Eval pryolysis and Fisher Assay, (2) development of a classification system using hand specimen and petrographic examination, (3) multi-element analysis, (4) SEM examination and the mineralogy and textural relationship between organic and mineral matter, and (5) determination of specific gravity.

Coalfield Geology

In 1985the Coal Section continued to collect and evaluate geological data from the Springhill, Debert and Pictou coalfields. In addition a small coal occurrence was investigated at Maple Brook, Inverness County.

At Springhill a detailed geological map of the Springhill coalfield has been completed and is scheduled for publication in fiscal year 1986/87.

A single hole was drilled at Springhill to investigate the stratigraphy between the Number 2 and underlying Numbers 6 and 7 seams. Samples of this hole have been sent for palynological identification.

Reconnaissance work was carried out on the sedimentology of the western end of the Debert-Kemptown Basin. Studies of the sedimentation of the basin and its margin will allow depositional modelling and definition of the geology and coal exploration potential of this basin.

In the Pictou coalfield, a reassessment of the stratigraphy and a study of the sedimentation of the basin have been undertaken using information generated by the recent coal exploration activity of Suncor Inc. The results of this work should further define the tectonic history of this graben structure and the mode of coal formation within the basin.

A base map of the Pictou coalfield has also been completed.

At Maple Brook, Inverness County, a small coal occurrence was investigated by two diamond drill holes. The results of the drilling negates chances of commercial coal in this syncline but adds new information on the Canso-Riversdale transition. A report on this investigation has also been completed.

PEATLAND INVENTORY

Nova Scotia has about 435,000 acres (175 000 ha) of peatland (about 4% of the province) concentrated in five main regions of the province (Fig. 11).

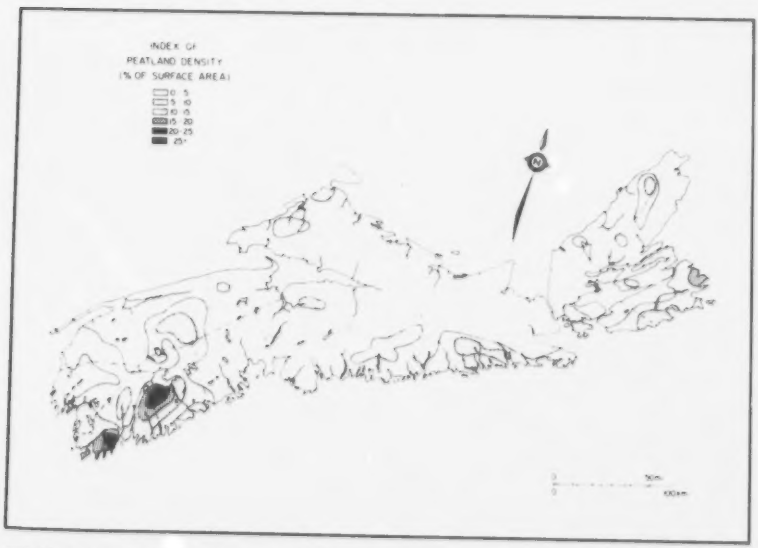


FIGURE 11. Peatland concentrations.

Resource Mapping

In 1985 the Peatland Inventory Program undertook a remote sensing project to delineate and classify the Province's peatland resources. A set of three maps covering the province at a scale of 1:250 000 has been created to provide information on all significant peat deposits in Nova Scotia.

The project also provides two sets of 1:125 000 maps which provide information on:

- Relative size and distribution of peatland types
- A simple biophysical classification of peatland type and relief
- Location of deposits identified by this department in 1980-84 and
- Summary tables on a province-wide and per mapsheet basis. The categories are:
  - total area of bog, fen, and swamp
  - total area of raised, sloping and/or flat peatlands
  - total area of inventoried deposits in each class and
  - total area of peatland resources.

During the project deposits totalling 433,372 acres (175 386 ha) were mapped and tabulated.

Data Processing

All data gathered during the field program havebeen entered in a computer disk base. Processing of these data generated summary reports specific to each sample site and inventoried deposit. Regional reports were generated from the summary reports to provide information on the resource character in each region and to delineate potentially mineable resources throughout the province.

Information from these reports is available to the public through the departmental library. A series of 1:10 000 planimetric maps of inventoried deposits is also available.

A brief list of information contained in the report files is as follows:

- Average depth and humification of peat in the deposit
- Average humification of specific peat types
- Percentage and volume of specific peat types
- Percentage cover of various surface vegetation assemblages
- Volume and percentages of various humification levels and
- Site-specific data; i.e., location, size, volume, access, drainage features, etc.

The map series consists of:

- Base Map showing peat margin and survey sites;
- Peat Isopach Map showing peat depth and average humification of peat at each site (3.39 ft [1m]) contour intervals;
- Elevation Map showing elevation of each site surveyed (deposits sampled using survey grids) 3.39 feet (1m) contour intervals; and
- Surface Cover Type Map showing site-specific data as well as overall vegetation patterns.

Final Report

This report was completed in March, 1986, and compiles all known data on the peat resources of Nova Scotia. In addition, the report provides basic information on the natural development of peatlands, their economic and ecological value, current harvesting technologies, climatic factors that may affect peat utilization and the economic potential of peatland development.

Peat Demonstration Project

As a result of the above work, discussions are currently underway regarding a possible Fuel Peat Demonstration project. The project would harvest fuel peat in southwestern Nova Scotia and distribute it to oil-dependent industrial customers. Hopefully the demonstration project will develop into a commercial-scale operation.

OIL SUBSTITUTION AND CONSERVATION

The Canada-Nova Scotia Oil Substitution and Conservation Agreement was initiated in 1977 to reduce Nova Scotia's dependence on imported oil through conservation and displacement by coal or other renewable resources. Programs submitted under this Agreement are considered by a committee of two federal and two provincial representatives.The Coal Section administers the program.

During the 1985/86 fiscal year, a total of 15 projects were considered for funding under this agreement. Four of these were turned down; three projects are still waiting for contracts to be signed. Projects for which contracts were signed are listed below:

- Total Tune Up Demonstration Project
- Wood Chip Demonstration Project
- Annapolis Tidal Project
- Britex Forest Residue Project
- Add-on Plenum Heater Project
- Install Modern Technology on a Industrial Sized Boiler
- Cape Breton Heating Oil Consumption Study
- Sydney Academy Boiler Conversion Study

ENERGY MANAGEMENT DIVISION

C. Ryan, P.Eng., Director

INTRODUCTION

The Energy Management Division has four primary responsibilities. The Division:

- Evaluates and analyzes policies and technologies affecting energy supply and demand,
- Co-ordinates energy planning and provincial submissions to energy regulatory agencies,
- Provides energy management and conservation programs, fuel substitution programs, and renewable and indigenous energy resource programs, and
- Provides programs that increase public awareness of energy conservation, energy supply options, provincial energy policies, plans and programs.

CHANGES IN ORGANIZATION

Responsibilities within the division were reorganized during fiscal year 1985/86 to reflect changes in the demand for and availability of services and programs. The Energy Programs Section (formerly the Public Programs Section) was reorganized and expanded to include the delivery of energy analysis and follow-up programs to the government and small business sectors, along with programs previously delivered to the residential sector by the Public Programs Section.

A new section, the Energy Project Engineering Section, was formed to carry out the planning, execution and management of technical studies and energy conservation and renewable energy projects. It replaced the former Energy Engineering Section. The Economics and Statistics Section remained unchanged, with responsibility for providing energy planning, policy evaluation, statistical analysis and regulatory submissions.

ACTIVITIES

Completion of Energy Plan 1985 required the cooperation of all sections during fiscal year 1985/86. This Plan outlines the broad policy options available to the Province in the energy area. It also sets out specific initiatives that can be undertaken by the Province in the medium term to achieve its objectives of energy stability and economic development. Energy Plan 1985 was being readied for printing and distribution at fiscal year end.

The Division continued to be heavily involved in the monitoring and analysis of issues relating to development of offshore hydrocarbon resources,

especially gas markets, energy pricing policies, U.S. and Canadian regulatory procedures, and gas distribution and transmission scenarios. The Economics and Statistics Section composed the Province's submission and prepared testimony for hearings before the National Energy Board into Canadian gas exports.

A new agreement with the federal government on conservation and renewable energy projects was negotiated during fiscal year 1985/86. The Memorandum of Understanding, a two year agreement covering the 1986/87 and 1987/88 fiscal years, outlines $6.7 million in joint and complementary activities. The Division was also successful in having almost $700,000 from the Canada-Nova Scotia Oil Substitution and Conservation Agreement Fund assigned to projects to develop a wood chip industry in Nova Scotia and to assess the potential for comprehensive residential heating system tune-ups.

Division conservation programs continued to enjoy a favourable public reception in fiscal year 1985/86. Staff of the new Provincial Energy Analysis Program performed energy analyses on 499small business and government buildings in their first year of operation. Requests from homeowners for publications and information on conservation and renewable energy continued to number in the thousands annually, and technical assistance to industry and business continued to be provided. The Solar and Wind Provincial Sales Tax Rebate Program authorized rebates of $70,909 in fiscal year 1985/86 based on inspections of 227 solar projects and one wind project, with a total installed cost of more than $1.04 million.

The Division is now using a new, computer-based model designed by staff to produce statistical reports on a monthly basis. Primary energy consumption in Nova Scotia declined 2.2 per cent during the 1985 calendar year to 226.18 trillion BTUs. This follows a marginal increase of 0.2 per cent in 1984. Petroleum accounted for 62.4 per cent of primary energy consumption in 1985, down from 63.7 per cent in 1984. Primary energy use is defined as the total energy input into the economy and includes petroleum, coal, hydro, electricity and natural gas.

Sales of refined petroleum products declined 3.8 per cent, following a 1.5 per cent decline in 1984. The 22 million barrels (3614.8 thousand m) used in 1985 is down from 33.4 million barrels (5306.1 thousand m^3) in 1978. This reflects the continued success of the Province's oil substitution and energy conservation programs.

Division staff represent the Department on a variety of national and international committees dealing with energy issues of concern to the Province. The Northeast International Committee on Energy (NICE) was established by

the Eastern Canadian premiers and New England governors as a result of the growing regional nature of energy trade and common energy concerns. During fiscal year 1985/86, Nova Scotia hosted a meeting of NICE. Staff of the Division participated in subcommittees dealing with energy supply and demand analysis within the region, emergency planning and organization of "Energy in the 1990s", a conference focusing on longer term energy issues scheduled for April, 1986, in Quebec City. Division staff wrote a manual on the retrofitting of hot water and steam heating systems on behalf of NICE.

Division personnel represented the Department on the demand restraint subcommittee of Interprovincial Advisory Committee on Energy (IPACE), and committees of the Canadian General Standards Board and Canadian Wood Energy Institute, among others.

ENERGY AWARDS

Each year the Division sponsors the Nova Scotia Energy Awards. Presentations are made by the Minister of Mines and Energy for outstanding contributions to energy management or fuel substitution. The following is a list of 1985 Nova Scotia Energy Award winners.

Category 1, Large Manufacturing

Scott Maritimes Limited, New Glasgow

- Reduced energy costs by more than $1 million annually by improving wood combustion efficiency.

Category 2, Business, Commerce and Non-government

F.E. Wade Limited, New Minas

- Reduced energy use by 55 per cent from the previous year

Acadia University, Wolfville

- Reduced oil consumption by 120,000 gallons a year with a new energy management system.

Category 3, Government

Royal Canadian Mounted Police, "H" Division, Halifax

- Achieved a significant reduction in energy consumption in buildings across Nova Scotia as a result of a comprehensive energy conservation campaign.

Category 4, Organizations and Community Groups

Amherst Stadium Commission

- Reduced energy use by 32 per cent through heating system improvements and heat recovery.

Nova Scotia Forest Products Association, Truro — Honourable Mention

- Extensive activity to promote wood chips as an energy source in Nova Scotia.

Category 5, Energy Innovation

Fenco Shawinigan Engineering Ltd., Halifax

- Design of a unique refrigeration heat recovery system for Farmers Co-operative Dairy Limited, Hammonds Plains.

Category 6, Individual

Don Roscoe, McGrath Cove, Halifax Co.

- Mr. Roscoe is a builder with a strong commitment to solar energy, a founding member of Solar Nova Scotia and a producer and presenter of the Solar Greenhouse Course.

Category 7, Transportation

Vanpools Ltd., Halifax

- The first vanpool operation in N.S. to obtain a Public Utilities Board license, Vanpools fleet of vans reduces gasoline consumption by several hundred thousand gallons each year.

Energy Programs Section

J. Gordon, Manager

INTRODUCTION

The goal of the Energy Programs Section is to promote the efficient and appropriate use of energy within the province. This is achieved through the conservation and fuel substitution programs provided to all sectors of the economy.

Three main working groups comprise the Energy Programs Section; the Provincial Energy Analysis Program, (PEAP), Residential Energy Programs, and the Energy Education Program.

PEAP provides on-site energy analyses to provincial and municipal government facilities and to small businesses with individual energy bills of less than $10,000 per year. The program also provides follow-up technical advice on the implementation of energy management measures recommended by these analyses.

Residential Energy Programs include information and motivational programs on residential energy use. This group is responsible for monitoring and addressing significant residential energy conservation issues, as well as assessing and surveying public attitudes toward energy. It also serves the public information needs of the Division by coordinating the production of technical and promotional printed material, audio-visuals and advertising.

The Energy Education Program carries out a variety of educational and outreach activities, often in co-operation with other departments, groups or associations.

RESIDENTIAL ENERGY PROGRAMS

Each year the Residential Energy Programs groupreceives thousands of requests from the public for advice and information. The Enerinfo phone line (1-424-5727), a province-wide, toll free advisory service, accounts for the majority of information requests. Written requests, referrals from other agencies and responses to Section promotional material account for the remainder. Information provided ranges from the very general to extremely specific and covers such topics as heating systems, air sealing, new home construction and vehicle fuel economy. In addition, the group responds to numerous requests for educational resource materials on energy matters every year.

The Residential Energy Programs group participates in major energy related trade shows each year using the Enerinfo display. In addition, staff provide seminars on topics such as wood heating, air sealing, insulation, condensation and heating system upgrading. Staff also respond to requests for site inspections of homes with major problems. There were 81 inspections, followed by recommendations, during this fiscal year.

During 1985 staff produced a new publication dealing with heating domestic water and revised existing publications on home heating systems and condensation. Section staff also cooperated in the design and production of publications for other sections, including the *1985 Nova Scotia Oil and Gas Report.*

Seminars on energy efficient housing were organized for Sydney, Halifax and Kentville, featuring building scientist, Mr. Joe Lstiburek of Engineering Design Corp., Toronto. A total of 193 contractors, tradesmen, suppliers, home builders and government officials attended these seminars. Staff also participated with Energy, Mines andResources Canada in delivering nine seminars to building supply industry employees across Nova Scotia.

The Residential Energy Programs group also received $105,000 in funding from the Canada-Nova Scotia Oil Substitution and Conservation Agreement Fund for the Total Tune-up Project. The Heating, Refrigerating and Air Conditioning Institute (HRAI) was contracted to train selected heating service companies in the total tune-up of heating systems. A total of 100 homes in seven centres received tune-ups to assess benefits of this type of service. Monitoring will be completed duringfiscal year 1986/87.

Staff of the Section represent the Department on numerous committees, including those of the Canadian Wood Energy Institute, Society, Environment and Energy Development Studies Foundation, Urea Formaldehyde Task Force, Canadian General Standards Board and the Energy Technical Committee of the Roads and Transportation Association of Canada.

Staff of the Section provided comprehensive information, printing and advertising services to the Division. This took the form of press releases on Division activities, seminar promotion through brochures and advertising, and advertising for programs such as the Provincial Energy Analysis Program. The Section also administers the annualEnergy Awards Program.

ENERGY EDUCATION PROGRAM

The Energy Education Program is responsible for increasing awareness of energy issues in the public school system through classroom presentations and the provision of resource materials. In fiscal year 1985/86, staff of the program made presentations to more than 35,000 students in 158 schools across Nova Scotia, a slight increase over the previous fiscal year. The highly successful publication *An Introduction to the Offshore* was reprinted, and activity sheets for elementary school children were printed and distributed.

PROVINCIAL ENERGY ANALYSIS PROGRAM

On March 31, 1985, the Enersave and Small Business Energy Analysis Programs were terminated due to the expiry of the federal/provincial agreements through which they had been funded. They were replaced by a provincially operated program known as the Provincial Energy Analysis Program (PEAP). PEAP provides free on-site, computer-based energy analyses to the public sector, regardless of annual energy consumption, and to those members of the small business sector whose annual energy consumption does not exceed $10,000. PEAP also provides a free follow-up advisory service designed to assist the client in interpreting and implementing retrofit suggestions.

For the period April 1, 1985, to March 31, 1986, 499 energy audits were completed on establishments with combined annual energy expenditures of $12,182,730. Potential annual energy savings of $1,341,440, representing 13 per cent of energy use, were identified in the public sector, and potential annual energy savings of $414,224 representing 22 per cent of energy use, were identified in the small business sector. This represents a combined total of 14.4 per cent in potential savings identified by the program. A summary is provided in Table 9.

Staff organized the formation of the Interdepartmental Committee on Building Energy Management. Its objective is to recommend the most effective strategy for reducing energy expenditures in buildings that receive funding directly or indirectly from the Province, while maintaining environmental quality in the workplace.

Provincial Energy Analysis Program staff also have been researching and writing a final evaluation report on the Enersave Program.

TABLE 9. Provincial Energy Analysis Program

	Public Sector	Small Business	Total
Audits	199	300	499
Total Energy Use ($)	10,300,000	1,882,730	12,182,730
Average Per Site ($)	51,759	6,276	24,414
Potential Savings Value ($)	1,341,440	414,224	1,755,644
Per cent Savings (%)	13	22	14.4

Combined Program Potential Savings — 14.4%

Economics and Statistics Section

V. Harnish, Manager

INTRODUCTION

The Economics and Statistics Section evaluates and analyzes issues arising from energy developments and policies of a provincial, national and international nature and recommends appropriate responses. The Section also administers a comprehensive energy planning program and is responsible for statistical reporting of energy supply and demand in Nova Scotia.

The Section prepares reports, position papers, publications and computer models and manages the preparation of studies by private consultants. Depending on the nature of the material, these studies are made available to other ministries, the public, energy corporations and other governments and agencies. The Section also prepares and coordinates submissions on behalf of the Province to regulatory authorities such as the National Energy Board.

ACTIVITIES

The major project completed by Section staff during the 1985/86 fiscal year was Energy Plan 1985. This work was carried out with significant input from other sections of the Division, the Energy Resources Division, the Nova Scotia Power Corporation and other departments and agencies. In preparing the energy plan, the Section produced forecasts of energy requirements under two scenarios, a target case and a status quo case. For the target case, initiatives were developed for the more efficient use of energy, the substitution of indigenous energy resources where economically feasible, and the development of technologies to permit new uses for and efficiency improvements in the current use of indigenous energy resources.

With the assistance of the federal government, the Department developed one of the most comprehensive and sophisticated energy supply/demand modeling systems available in Canada. The flexibility of the model will allow updates of energy supply/demand projections to be prepared on a regular basis. This flexibility will be of great assistance in adjusting forecasts and initiatives to reflect changing circumstances.

Section staff closely monitored regulatory changes in Canada and the United States to determine their potential impact on the Venture Gas Project. Staff also prepared a submission to the National Energy Board for Phase I of the Omnibus Gas Export Hearing.

The other major undertaking during the year was an interdepartmental study of regulation of the motor gasoline and diesel oil industry in Nova Scotia.

Topics of a shorter term nature included support for an intervention on behalf of the Government before the Board of Commissioners of Public Utilities against a proposed gasoline price increase in January, 1986. Staff also participated in national and international emergency energy planning committee sessions.

In addition to policy-oriented issues, statistical data are compiled, analyzed and presented on a regular basis. The addition of a statistics research assistant has enhanced the capability and timeliness of this function. During the past year staff

have provided a monthly energy fact sheet containing data on supply, demand and pricing of coal, electricity and petroleum products and have prepared the annual Energy Statistical Profile.

The Section has also begun to convert a number of computer programs previously running on external computer systems to operate on micro computers within the Department. Several computer-based energy demand and price forecasts were completed by staff, along with calculations of pipeline tariffs using a model developed by Section staff.

The Section continued to administer the Electric Power Rate Subsidy Program, explain program changes and prepare rate books for local utilities. Rates are analyzed for decision-makers on a continuing basis.

Energy Project Engineering Section

INTRODUCTION

The Energy Project Engineering Section (formerly part of the Engineering Section) is responsible for the planning, execution and management of technical studies and projects related to renewable energy, energy conservation and fuel utilization alternatives.

ACTIVITIES

The Section's major activity during fiscal year 1985-86 was the design and implementation of a two-year project to develop a supply infrastructure and market demand for chipped wood fuel. This fuel can be produced from logging residues, unmerchantable forest stands or species, or other non-commercial forest biomass. The fuel can be handled easily by automated systems and enjoys a price advantage over oil. The capital cost of fuel handling and combustion systems, although considerably higher than oil-fired systems, can be repaid from fuel cost savings in five years or less in many applications.

Financial support for this wood chip program was obtained through the Canada-Nova Scotia Oil Substitution and Conservation Agreement Fund. The Wood Chip Development Project provided $140,000 to the Nova Scotia Forest Products Association to develop markets for wood chip fuel. Staff worked closely with the N.S. Forest Products Association in selecting a project officer, producing promotional literature, holding a conference, meeting with the potential wood chip users and other market development activities. A total of $120,000 was also given to McMullin-Barnhill Forest Products Ltd., Brookfield,

and to Barrett Enterprises Ltd., Lower Sackville, towards the purchase and operation of wood chipping equipment. These grants helped create an initial supply of fuel for prospective users. The two companies were selected from more than 20 applicants by a steering committee representing three government departments and two woodlands organizations. Assistance of $321,825 was provided to Britex Ltd. to offset the cost of installing wood handling and combustion equipment at its textile plant in Bridgetown, thereby creating a major market for chipped fuel in the Annapolis Valley area.

Related activities included preparation of a presentation to the Select Committee of the Legislature on Forestry (Woodchips and Biomass), the review of proposals for the use of chipped wood fuel at several government facilities, and the initiation of an economic impact analysis of wood chip harvesting and use, to be completed in early 1986-87.

Section staff played a major role in preparing material for Energy Plan 1985, especially the residential, transportation and alternate fuels sections. Federal funds were utilized to monitor and report on projects completed under the federal-provincial Pilot Projects Program (a component of the now expired Canada/Nova Scotia Subsidiary Agreement on Energy Conservation). As part of this contract, financial assistance was provided to Solar Nova Scotia for updating the 1982 Solar Greenhouse Course.

The ability to analyze energy conservation and fuel substitution projects was enhanced by acquiring computer software, which was in use by fiscal year end.

Funding was provided to bring building scientist Mr. Joe Lstiburek to the province to speak at housing seminars arranged by the Energy Programs Section. Staff completed an analysis of the wind regime data at Riverport, and arranged maintenance of the data collection equipment and its relocation to Clark's Harbour.

Staff continued to monitor technology developments within its area of responsibility. Personnel attended various meeting and seminars,including the New England Gas Association Operations School, the Canadian Hydrogen Industry Council annual meeting, the Industrial Heat Pump Seminar, a review ofbiomass developments in the Maritimes, the New Energy Sources Conference, the International Hydrogen Industry Council Conference and the Fourth Annual Canadian Building Congress. Staff also participated with the Public Programs Section in delivering seminars to the building supply industry in Nova Scotia.

ADMINISTRATION DIVISION

C.R. James, C.M.A., Director

The Administration Division provides the Department with financial, operational, and personnel management. It also provides cartographic and administrative services to the Department and accounting services for Novaco Limited. The Director is Secretary-Treasurer of this crown corporation.

Under the Department Budgetary System, the Administration Division consists of the Offices of the Minister and Deputy Minister, Energy Branch Administration, Mines and Minerals Branch Administration, and the Administration Division.

The duties and functions of the Division are divided into four sections: Accounting Services, Mineral Taxation and Fiscal Planning, Personnel and Administration, and Cartography.

The Administration Division is responsible for mineral and petroleum resource revenue policy, the collection of mineral royalties and taxes, and for the management and evaluation of government funded coal mine and coal miner assistance programs.

Accounting Services Section

Ken Faulkner, C.M.A., Manager

The Accounting Services Section provides managerial and financial accounting and performs statistical services for the Department.

The Section is responsible for maintaining and updating the computerized departmental accounting system which provides internal control by recording, reporting and reconciling expenditures with Department of Finance information. The Management Information System provides a monthly and year-to-date report of expenditures compared to the department budget. These reports are circulated to Section Managers monthly and a summary report goes to the Deputy Minister and Minister and have contributed in a large measure to the Department's success in maintaining expenditures within budget authority.

The Section administers two Coal Miners Assistance Programs. The DOSCO (1923) pension is paid to specified former Acadia Coal Company Limited employees. The Independent Coal Miners' Pre-Retirement Leave Plan is designed to alleviate the hardships of older employees forced to leave mine work force due to production cutbacks or mine closure. As at March 31, 1986, 40 former miners were receiving the DOSCO (1923) pension and 81 were receiving Pre-Retirement Leave benefits.

Mineral Taxation and Fiscal Planning Section

Blair McMullin, Manager

The Mineral Taxation and Fiscal Planning Section is responsible for resource revenue policy and administration of mineral royalty and tax legislation. This section administers the Coal Mines Investment Security Program, which has replaced the Independent Coal Mines Subsidy Program.

The Section also provided accounting services for Novaco Limited, a provincial crown corporation.

MINERAL ROYALTIES AND TAXES

This Section manages the royalty and tax provisions of the *Mineral Resources Act* and *Gypsum Mining Income Tax Act.*

The revenue from royalties and taxes reported by the Department are shown for a 20 year period in Figure 12 and for the current fiscal year in Table 10.

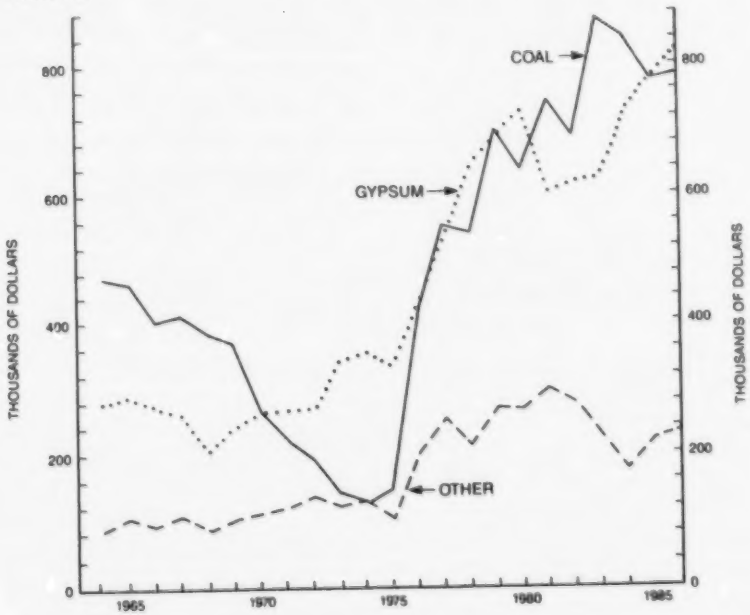


FIGURE 12. Historical review of royalties and taxes.

TABLE 10. Royalties and taxes for the fiscal year ended March 31, 1986.

Commodity	Royalty or Tax
Gypsum	$ 820,653
Coal	781,160
Salt	207,508
Other	24,988
TOTAL	$1,834,309

COAL MINE INVESTMENT SECURITY PROGRAM

The Coal Mines Investment Security Program replaced the Independent Coal Mines Subsidy Program effective January 1, 1986 and provides assistance to Evans Coal Mines Limited, St. Rose, Inverness County.

The Subsidy Program guaranteed a profit for the operator and was implemented to maintain the industry in a declining coal market.

The Coal Mine Investment Security Plan is designed to promote self-sufficiency through operational efficiency and increased productivity. The operator is protected against major losses that could result from extended periods of low output.

NOVACO LIMITED

The Section administers the accounting control function of this Crown Corporation. During the year the general ledger of the Company was transferred directly to this Section from an external computerized system. Management information is provided on a monthly basis.

Personnel and Administration Section

P. Edwards, Manager

This Section provides advice and support on personnel management to all divisions of the Department. The responsibilities of the Section include recruitment, staff relations, compensation, establishment and maintenance of performance appraisal systems, career development training, personnel and payroll documentation, and the maintenance of employee records. The Section is also responsible for the continual upgrading of office and administrative services for the Department.

A long term disability plan was implemented during the year to provide coverage for extended illness and non-work related injury.

A facility for a Central Registry Office has been established and we are now in the process of centralizing our filing system in accordance with the Records Management Program.

Our university student recruitment program provided summer employment for 40 students. Sixteen people were employed under the provincial Fall Employment Program.

During the year the Section provided support in recruiting a number of staff to work on programs related to the new five-year Canada-Nova Scotia Mineral Development Agreement.

Throughout the year staff attended various inservice and external courses and programs covering areas such as management and supervisory development, communication skills, clerical/secretarial development and occupational health and safety.

Personnel changes are shown in Table 11.

TABLE 11. Personnel changes during the fiscal year 1985-86.

Appointments		Separations
Prabha Chopra	Jim Patterson	Krista McGregor
Allan Crandlemire	Barbara Milburn	Lynda Burke
Doug Rigby	Leslee Hughes	Lois Tower
Barbara MacDonald	Mary Wolfe	Jane Allt
Robert Ryan	Gordon Dickie	Karen Reid
David Carter	Judith Taggart	Colette Deschenes
Mike Corey	Carolyn Downie	Katherine Mills
Linda Ham	Lorne MacNeil	Mary Smith
Richard Horne	Elizabeth MacDougall	James Hamilton
Martha Devanney	Michael McPhee	Mary Smith
Jennifer Bates	Patricia Fraser	Byron Rafuse
Mark Graves	Janet Fownes	
Ron Mills	Daniel Kontak	**Retirements**
Donald Weir	Madeleine Missions	Roy Slater
Gordon Adams	Lila Demone	Donald Bernasconi
William Smith		James Brown
		Melissa Wolfe

Cartographic Section

Joe Campbell, Manager

The Cartographic Section provides drafting and related services as well as photography for all divisions of the Department. A wide variety of geological and energy related drawings were produced in the past year for use in publications and visual presentations.

The photographic unit reproduced material for publication purposes, furnished slides for audio-visual presentations, and prepared photographs for graphic displays. Also, a variety of field photography arrangements were completed for several divisions of the Department.

Two drafting technicians were hired to deal with the added work load created by the employment of several new professional staff members contracted through the Canada-Nova Scotia Mineral Development Agreement.

FINANCIAL INFORMATION

The Department of Mines and Energy had 162 people on staff as of March 31, 1986. During the 1985-86 fiscal year, the Department administered expenditures of $47,525,000 while recovering $2,762,500 from various funds. Royalties and mining taxes as reported in Table 10 were $1,875,000, and the licences and fees were $381,900 for total revenue of $2,256,900.

Operations and assistance are budgeted in the Department. Other includes expenditures budgeted under a Public Service Vote and in the Department of Development.

Operations information is presented by budget subject title by division.

"Assistance information" is presented by budget subject title under two sectors: Coal Industry and Energy.

"Other" is presented by the legislative vote title or the department where the funds have been budgeted.

As the expenditure information provided was drawn from the publications *Estimates of the Government of Nova Scotia* and *Public Accounts of the Province of Nova Scotia*, the subject titles may differ from the sectional titles drawn from the Department Organization Chart.

TABLE 12. Financial information about the Department of Mines and Energy

Division Activity Budget Subject Title	Actual Expenditure 1984-85	Estimate 1985-86	Final Forecast 1985-86
OPERATIONS			
ADMINISTRATION DIVISION			
1. Office of the Minister and Deputy Minister	$ 389,383	$ 448,300	$ 415,500
2. Accounting, Personnel and Administration	405,065	462,300	431,200
3. Cartographic Services	248,640	274,500	295,600

TABLE 12. Continued

Division Activity Budget Subject Title	Actual Expenditure 1984-85	Estimate 1985-86	Final Forecast 1985-86
4. Energy Branch Administration	322,885	340,800	319,300
5. Mines and Minerals Branch Administration	372,357	380,800	368,500
LESS: CHARGEABLE	(198,650)	(283,300)	(271,900)
TOTAL Administration Division	$ 1,539,680	$ 1,623,400	$ 1,558,200
ENERGY MANAGEMENT DIVISION			
1. Enersave Programs	$ 1,201,275	$ —	$ —
2. Provincial Energy Analysis	—	452,400	1,451,000
3. Energy Planning & Statistics	252,360	677,400	394,900
4. Energy Advisory Services	248,745	365,600	347,900
5. Energy Engineering	109,360	172,100	120,300
6. Energy Publications	—	32,000	
7. National Conservation and Alternative Energy Initiatives	—	—	—
LESS: CHARGEABLE	(180,858)	(546,000)	(311,900)
TOTAL Energy Management Division	$ 1,630,882	$ 1,153,500	$ 1,002,200
ENERGY RESOURCES DIVISION			
1. Petroleum Resources	$ 397,296	$ 539,300	$ 450,100
2. Coal Exploration	268,638	279,300	244,400
3. Peatlands Inventory	118,563	135,300	128,000
4. Coal Development and Utilization	103,444	158,400	149,700
LESS: CHARGEABLE	(379,076)	(539,300)	(450,100)

TABLE 12. Continued

Division Activity Budget Subject Title	Actual Expenditure 1984-85	Estimate 1985-86	Final Forecast 1985-86
TOTAL Energy Resources Division	$ 508,865	$ 573,000	$ 522,100
DRILL AND MECHANICAL DIVISION			
1. Drilling Services	$ 440,772	$ 486,400	$ 567,900
2. Operations & Maintenance	274,816	305,200	281,600
TOTAL Drill and Mechanical Division	$ 715,588	$ 791,600	$ 849,500
MINING ENGINEERING DIVISION			
1. Mining Engineering	$ 177,116	$ 189,000	$ 186,500
2. Mine Safety and Inspection	437,205	499,400	492,400
TOTAL Mining Engineering Division	$ 614,321	$ 688,400	$ 678,900
MINERAL RESOURCES DIVISION			
1. Mineral Resource Evaluation	$ 202,719	$ 218,800	$ 197,400
2. Regional Surveys	298,219	305,100	305,000
TOTAL Mineral Resources Division	$ 500,938	$ 523,900	$ 502,400
MINERAL DEVELOPMENT DIVISION			
1. Resource Geology	$ 131,713	$ 137,100	$ 125,300
2. Regional Exploration Services	190,013	229,000	216,500
3. Library Services	133,459	170,000	131,000
4. Mineral & Petroleum Titles	109,318	121,200	102,300

TABLE 12. Continued

Division Activity Budget Subject Title	Actual Expenditure 1984-85	Estimate 1985-86	Final Forecast 1985-86
TOTAL Mineral Development Division	$ 564,503	$ 657,300	$ 575,100
TOTAL OPERATIONS	$ 6,074,777	$ 6,011,100	$ 5,688,400
ASSISTANCE PROGRAMS			
COAL INDUSTRY ASSISTANCE			
1. Coal Miners' Assistance	$ 472,926	$ 510,000	$ 470,100
2. Coal Development — Novaco	75,000	75,000	75,000
3. Coal Mines Subsidy	571,119	377,000	260,000
4. Coal Reclamation Project	39,463	—	—
TOTAL Coal Industry Assistance	$ 1,158,508	$ 962,000	$ 805,100
ENERGY ASSISTANCE			
1. Coal Liquefaction	$ 245,902	$ 250,000	$ 250,000
2. Oil Substitution	1,091,089	2,234,800	2,186,500
TOTAL Energy Assistance	$ 1,336,991	$ 2,484,800	$ 2,436,500
TOTAL ASSISTANCE	$ 2,495,499	$ 3,446,800	$ 3,241,600
OTHER PROGRAMS			
OTHER			
1 Power Rate Assistance Budgeted as a Public Service Vote	$35,641,488	$36,676,000	$36,676,000

TABLE 12. Continued

Division Activity Budget Subject Title	Actual Expenditure 1984-85	Estimate 1985-86	Final Forecast 1985-86
2. Energy and Mineral Subsidiary Agreements Budgeted in Department of Development	$ 3,619,066	$ 2,100,000	$ 1,919,000
TOTAL Other	$39,260,554	$38,776,000	$38,595,000
TOTAL EXPENDITURES ADMINISTERED BY DEPARTMENT OF MINES AND ENERGY	$47,830,830	$48,223,900	$47,525,000

LEGISLATION

INTRODUCTION

The Nova Scotia Department of Mines and Energy receives its mandate from the *Public Service Act.* This Act provides for a Department of Mines and Energy and the appointment of a Deputy Minister. It also provides for the function of the Department and its employees.

The following Acts are administered by the Department of Mines and Energy:

Mineral Resources Act S.N.S. 1975, c.12.

The *Mineral Resources Act* governs the disposition of mineral rights, administrative procedures, resources management requirements, and royalties. Stone, sand, gravel, peat, some gypsum and limestone, oil gas, and oil shale fall outside this Act. Coal, salt, potash, and uranium may only be worked under license by Order of the Governor-in-Council. There is a moratorium on all uranium exploration activity in the Province.

Treasure Trove Act R.S.N.S. 1967, c.314.

The *Treasure Trove Act* regulates the exploration for precious stones and metals in a state other than their natural state. Forms for exploration and royalties are provided by Order of the Governor-in-Council.

Coal Mines Regulation Act R.S.N.S. 1967, c.36.

The *Coal Mines Regulation Act* governs operation and safety in provincial coal mines. Coal mines operated by the Federal Government through Crown corporations, such as the Cape Breton Development Corporation, are inspected and regulated under the Canada Labour Code. Provincial operations are inspected by the Nova Scotia Department of Labour and Manpower.

Gas Storage Exploration Act S.N.S. 1970, c.6.

The *Gas Storage Exploration Act* governs exploration and development of underground storage of liquid or gaseous petroleum products.

Metalliferous Mines and Quarries Act R.S.N.S. 1967, c.183.

The *Metalliferous Mines and Quarries Act* governs operation and safety in mines and quarries that are not otherwise covered by the *Coal Mines Regulation Act.* Quarries operated by the Department of Transportation do not fall under this Act. Inspections are performed by the Nova Scotia Department of Labour and Manpower.

Gypsum Mining Income Tax Act R.S.N.S. 1967, c.122

The *Gypsum Mining Income Tax Act* provides for reporting procedures and income tax formulae for gypsum mining operations in the Province.

An Act to Confer Certain Powers Upon the Lieutenant Governor-in-Council and to Amend the Mines Act S.N.S. 1918, c.16.

Certain powers are conferred on the Lieutenant Governor-in-Council for the purpose of maintaining an acceptable level of stability in the Coal Mining Industry. The Act provides authority for a subvention program for independent coal mine operators, a pre-retirement leave program, coal waste dumps reclamation project, and operation of Novaco.

Petroleum Resources Act S.N.S. 1980, c.12.

The *Petroleum Resources Act* came into force July 28, 1984 and it regulates the administration and distribution of petroleum rights in Nova Scotia. By amendment, (S.N.S. 1984, c.64) the Governor-in-Council may limit the application of this Act to the onshore region.

Energy and Mineral Resources Conservation Act S.N.S. 1980, c.5.

The *Energy and Mineral Resources Conservation Act* provides authority to establish an Energy Board to hear matters arising out of such Acts as the Gas Utilities Act, Pipeline Act, etc. By amendment (S.N.S. 1984, c.60) the Governor-in-Council may amend the application of this Act may designate the Public Utilities Board of Commissioners as the Energy Board. This Act and the amendment came into force July 28, 1984.

Gas Utilities Act S.N.S. 1980, c.7.

The *Gas Utilities Act* regulates the process wherein an applicant may seek and obtain approval for a franchise to operate a gas utility. By amendment (S.N.S. 1984, c.61) the Act may be limited to certain geographic areas and certain operations. The Act and amendment came into force July 28, 1984.

Pipeline Act S.N.S. 1980, c.13.

The *Pipeline Act* regulates all aspects of transmission of oil and gas. The Act may be limited to certain transmission lines and certain geographic areas as provided for by amendment in (S.N.S. 1984, c.65.) The Act and amendment came into force July 28, 1984.

Canada-Nova Scotia Oil and Gas Agreement Act S.N.S. 1984, c.12.

The *Canada-Nova Scotia Oil and Gas Agreement Act* mirrors federal legislation implementing and giving effect to the Canada-Nova Scotia Agreement on Offshore Oil and Gas Resources Management and Revenue Sharing providing the framework for administration and regulation of offshore oil and gas exploration and production.

Offshore Oil and Gas Act S.N.S. 1984, c.8.

The *Offshore Oil and Gas Act* is another of the offshore legislation package. This Act, along with the federal counterpart, regulate acquisition and disposition of offshore oil and gas rights. Crown share, Canadian ownership rates, transfers, and other matters are also addressed.

Oil and Gas Production and Conservation (Nova Scotia) Act S.N.S. 1984, c.9.

Exploration, drilling, development, and production of oil and gas in the offshore are regulated by the *Oil and Gas Production and Conservation (Nova Scotia) Act* and the federal counterpart.

APPENDIX A

PUBLICATIONS FOR FISCAL YEAR 1985-86

Mines and Minerals Branch

Report 85-1	*Mines and Minerals Branch, Report of Activities,* 1984, 232 pages. $16.00 (Microfiche $3.00)
Report 85-2	*Index to Assessment Reports 1984* (with Keyword Index), by N. A. Lyttle and J. Gillespie-Wood, 18 pages. $5.00 (Microfiche $2.00)
Report 85-3	*Index to Publications, Open File Reports, and Open File Maps for 1984* (with Keyword Index), by N. A. Lyttle and J. Gillespie-Wood, 94 pages. $10.00 (Microfiche $4.00)
Report 85-4	*Drilling Logs of Government Core Drills, 1984*, compiled by I. MacDougall and D. E. Polly, 1984, 32 pages. $3.50 (Microfiche $2.00)
Report 86-3	*Drilling Logs of Government Core Drills, 1985*, compiled by I. MacDougall and D. E. Polly, 1986, 21 pages. $3.50 (Microfiche $2.00)
Map 85-1	*Industrial mineral commodities map of the Province of Nova Scotia;* John H. Fowler (compiler), 1985; scale 1:500 000. $5.00
Map 85-2	*Loch Lomond Basin and Glengarry Half Graben* by R. C. Boehner and G. Prime, scale 1:50 000. $5.00
Map 85-3	*Aggregate Resources, Cape Breton Island* by W. J. Wright, scale 1:125 000 (locates and names aggregate pits and quarries). $3.00
Maps 85-4 to 85-6	*Aggregate Resources, Cape Breton Island,* by W. J. Wright, scale 1:125 000. (locates and shows the type, quality and observed thickness of sand and gravel deposits) ($3.00 each)

Energy Branch

Conservation in Public Buildings
Free

Small Business Energy Analysis Program
Free

1984 Energy Statistical Profile
Free

An Introduction to the Offshore
Free

Controlling Condensation in the Home
Free

Home Heating Workbook
Free

Forest Residue Woodchip Substitution Study
Free

Energy Efficient Housing Seminar
Free

Heating Domestic Water
Free

Nova Scotia Oil and Gas Report
$2.00

Coal in Nova Scotia
$5.00

Energy Plan 1985
Free

APPENDIX B

PRODUCTION INFORMATION FROM MINES, QUARRIES AND OTHER OPERATIONS

In this appendix each production site is described and located. Tables B-1 to B-5 summarize the production figures for each commodity or mineral. Site locations are shown on the accompanying maps, Figures B-1 to B-4. Production data are for the calendar year January 1, 1985 to December 31, 1985.

The mining industry in Nova Scotia employed more than 5,800 people. The value of the materials produced was in excess of $355 million.

METAL MINES AND GOLD MINES

No gold production was recorded in 1985; however, there is increased activity and gold production is expected to recommence in 1986 or early 1987.

Tin

The Province's sole base metal producer, Rio Algom Ltd., commenced milling ore in October 1985, as detailed below. The location is shown on Figure B-1 and production in Table B-1.

RIO ALGOM LTD.

Manager:	K. Collison, P.Eng.
Address:	P. O. Box 6, East Kemptville, N. S. B0W 1Y0
Production:	258 tonnes tin concentrate

The concentrator commenced milling ore in October, 1985. The tune-up period for the mill will take several months with full production expected in mid-1986. Trouble with the amount of clay in the ore has caused settling problems in the tailings dam, resulting in a higher than permitted level of suspended solids in the tailings dam discharge.

The proposed mining rate at full production will be 9,900 tons/day (9 000 t/d). The annual output of metals contained in concentrates is expected to be 4,850 tons (4 400 t) of tin, 2,650 tons (2 400 t) of zinc and 1,650 tons (1 500 t) of copper.

TABLE B-1. Metals production for the calendar year 1985

Company	Location	Production tons	Production tonnes	Total Number Employed	Approximate Value
Tin					
Rio Algom Limited	East Kemptville, Yarmouth County	292 tin concentrate	265	210	$2,650,000[1]
	TOTAL FOR BASE METAL PRODUCTION	292	265	210	$2,650,000[1]

COAL MINING OPERATIONS

At the beginning of 1985 there were three underground coal mines, three open pit mines and three coal dump reclamation plants in operation. Table B-2 summarizes production information for the coal mines. The location of these operations is shown in Figure B-1.

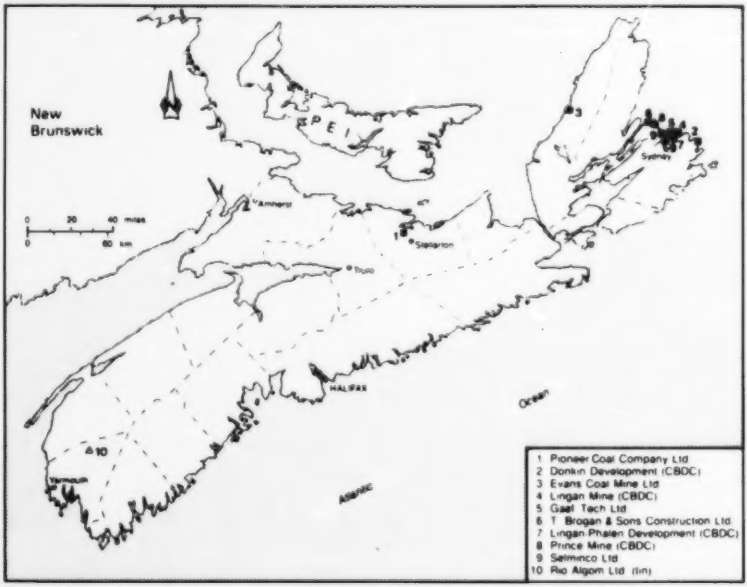


FIGURE B-1. Location of the tin mine, coal production sites and coal development projects.

Underground Coal Mines

EVANS COAL MINES LTD.

Manager:	G. Evans
Address:	R.R. #1, Inverness, N. S. B0E 1N0
Production:	34,063 tons (30 902 t) coal
Employees:	40

The St. Rose Colliery, Inverness County, is owned and operated by Evans Coal Mines Ltd. The entireproduction is either from development headings or by room and pillar mining followed by pillar recovery.

TABLE B-2. Coal production for the calendar year 1985

Company	Mine Name	Location	Production (salable coal) tons	Production (salable coal) tonnes	Total[1] Number Employed	Approximate Value[3]
Underground Mining						
Cape Breton Development Corp. (CBDC)	Prince Mine Phalen Mine Lingan Mine	Point Aconi, Cape Breton County Lingan, Cape Breton County Lingan, Cape Breton County	2,686,005[2]	2 436 728[2]	3,605	
Evans Coal Mines Ltd.		St. Rose, Inverness County	34,063	30 902	40	
		TOTAL (underground)	2,720,069	2 467 630	3,645	
Open Pit Mining						
T. Brogan Ltd.		Point Aconi, Cape Breton County	65,155	59 108	19	
Novaco Ltd.		Point Aconi, Cape Breton County Springhill, Cumberland County	58,963	53 491	2	
Pioneer Coal Company		Westville, Pictou County	86,220	78 227	10	
		TOTAL (open pit)	210,347	190 826	31	

TABLE B-2 Continued

Company	Mine Name	Location	Production (salable coal) tons	Production (salable coal) tonnes	Total[1] Number Employed	Approximate Value[3]
Reclamation						
Selminco Inc.		Sydney Mines, Cape Breton County	12,5443	113 801	65	
Gael Tech Inc.		Sydney Mines, Cape Breton County	17,082	15 497	30	
		TOTAL (reclamation)	142,525	129 298	95	
		TOTAL FOR ALL COAL PRODUCERS	3,072,941	2 787 254	3,771	$167,966,475

[1]personnel employed in clerical, supervisory, etc. positions as well as mining personnel
[2]washed coal
[3]estimated from Nova Scotia Department of Mines and Energy sources

March 3, 1987

Following a roof fall last year on the east side of the mine, all development work and production has been on the west side. Production has been affected by faulting and geological problems.

A program to rehabilitate the mine, which is funded by a $1.5 million grant from federal government, is going ahead and will be completed in 1986.

CAPE BRETON DEVELOPMENT CORPORATION

Manager:	Robert Cooper, P.Eng. Vice President, Mining Operations
Address:	P. O. Box 2500, Sydney, N. S. B1P 6K9
Production:	2,731,679 tons (2 478 163 t) coal
Employees:	3,605

The Cape Breton Development Corporation (CBDC) is a federal crown corporation that operates two producing underground coal mines in the province. The Corporation has two additional underground mines under development near Lingan and Donkin.

Production has been seriously affected by the closure of No. 26 Colliery last year following a fire.

LINGAN MINE (Harbour Seam)

This mine is located at Lingan near New Waterford. Coal is recovered by fully mechanical advancing longwall faces.

Longwall face 9E operated all year, face 5W ceased production on October 18, face 8E had only a few days life left at the year end and face 6W started production on July 3.

PRINCE MINE

This mine is located at Point Aconi. The coal is extracted by fully mechanical retreating short wall faces. Extraction was completed on the 5 East face on August 9, while 4 West face operated all year. The development work is complete to establish face 6 East, and development work is underway to establish faces 5 West and 7 East.

Work driving the main slopes continued, and by year end the slopes were beyond the Main Erosion Belt where stone problems could be expected to cause problems if production faces were established in that area.

Mines Under Development

LINGAN PHALEN DEVELOPMENT

The concrete portal for the third slope was completed. No. 2 slope had advanced to 5,700 ft., No. 3 slope 5,660 ft. and No. 4 slope to 4,750 ft. No. 1 slope driven from the 2,330-foot point on No. 2 slope, had advanced 580 ft. and No. 5 slope, leaving No. 4 slope at 2,330 ft., had advanced 250 ft.

DONKIN-MORIEN DEVELOPMENT

During January/February, 1985, a bulk sample to test coal quality was extracted from the Harbour Seam at the end of the No. 2 tunnel.

The tunnel boring machine was dismantled at the completion of No. 2 tunnel and is being installed in No. 3 tunnel.

Surface Coal Mines

NOVACO LTD.

President:	Malcolm Turner, P.Eng.
Address:	P.O. Box 147, Sydney Mines, N. S. B1V 1Y3
Production:	58,963 tons (53 491 t) coal
Employees:	2

The Point Aconi open pit mine is owned by Novaco, a provincial crown corporation. The mining is done under contract by Pioneer Coal Company, a subsidiary of Nova Construction Ltd. of Antigonish. With the exhaustion of coal reserves mining ceased in 1985, and final site reclamation is underway.

PIONEER COAL CO.

Manager:	D. Clifton
Address:	P.O. Box 929, Westville, N. S. B0K 2A0
Production:	86,230 tons (78 227 t) coal
Employees:	33

The open pit mining of the Acadia and Scott Seams crown pillars has continued.

T. BROGAN & SONS CONSTRUCTION LTD.

Manager:	T. Brogan
Address:	P.O. Box 199, Florence, N. S. B0C 1J0
Production:	65,153 tons (59 106 t) coal
Employees:	14

An open pit coal mine is operated at Point Aconi, Cape Breton County, by this company. The overburden is removed by a dragline excavator, and the exposed coal is ripped with a bulldozer and loaded into trucks with a front-end loader.

Coal Reclamation Plants

SELMINCO INC.

Manager:	D. Frederickson
Address:	P.O. Box 189, New Waterford, N. S. B1H 4N9
Production:	125,443 tons (113 801 t) reclaimed coal
Employees:	65

The company operates two reclamation plants. One reclaims coal from the Prince Mine Dump at Sydney Mines. The other is reclaiming coal from the dump at Scotstown, near New Waterford.

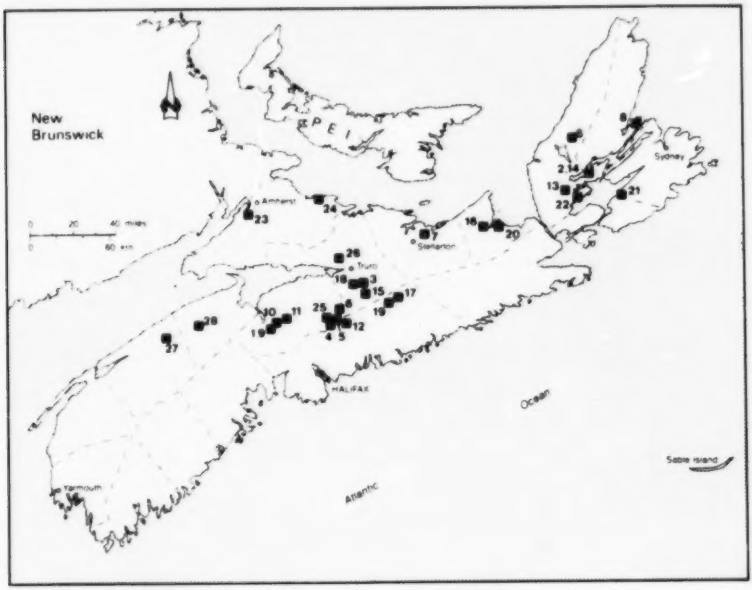
GAEL TECH INC.

Manager:	Tony Fisher
Production:	17,082 tons (15 497 t) reclaimed coal
Employees:	30

This company has a plant to reclaim coal from the fines previously produced by the Sydney Mines Wash Plant. This plant is not yet in commercial production, and the reported production was obtained from selective clean-up of the old dump area.

INDUSTRIAL MINERALS

Industrial minerals form a significant part of the total mineral production in Nova Scotia. Fifteen quarries or mines produce gypsum, salt, anhydrite, limestone, barite and dolomite. The locations of these mines or quarries is shown on Figure B-2. Table B-3 summarizes production information. Additional information about secondary manufacturing is given in Table B-4.



ANHYDRITE
1 Fundy Gypsum Co Ltd
2 Little Narrows Gypsum Co Ltd

BARITE
3 Nystone Chemicals Ltd

CLAY AND SHALE
4-7 L E Shaw Ltd

DOLOMITE
8 Scotia Limestone Ltd

GYPSUM
9-10 Fundy Gypsum Co Ltd
11 Domtar Construction Materials
12 National Gypsum Canada Ltd
13 Georgia Pacific Corp , Bestwall Division
14 Little Narrows Gypsum Company Ltd
15 Canada Cement Lafarge Ltd
16 Nova Construction Ltd
17 Mosher Limestone Ltd

LIMESTONE
18 Canada Cement Lafarge Ltd
19 Mosher Limestone Ltd
20 Ridge Brokers Ltd
21 Scotia Limestone Ltd
22 Nova Scotia Sand and Gravel Ltd (marble)

SALT
23 Sifto Salt Division, Domtar Chemical Group
24 Canadian Salt Company Ltd

SILICA SAND
25-26 Nova Scotia Sand and Gravel Ltd

STONE
27 Heritage Memorials Ltd

PEAT MOSS
28 Annapolis Valley Peat Moss Co

FIGURE B-2. Location of industrial minerals production sites.

TABLE B-3. Industrial minerals production for the calendar year 1985

Company	Location	Production tons	Production tonnes	Total[1] Number Employed[1]	Approximate Value[3]
GYPSUM					
Fundy Gypsum Co. Ltd.	Miller Creek and Wentworth, Hants County	1,483,119	1 345 477	185	
Little Narrows Gypsum Co.	Little Narrows, Victoria County	1,004,358	911 148	91	
Domtar Construction Materials Ltd.	Windsor, Hants County	12,809	11 620	12	
National Gypsum (Canada) Ltd.	Milford, Halifax County	3,021,422	2 741 016	112	
Georgia Pacific Corp.	River Denys, Inverness County	982,911	891 691	55	
Canada Cement LaFarge, Ltd.	Upper Brookfield, Colchestrer County	2,588	2 348	see limestone	
	TOTAL (gypsum)	6,507,207	5 903 300	455	$41,523,276
ANHYDRITE					
Fundy Gypsum Co. Ltd.	Miller Creek and Wentworth Creek, Hants County	137,250	124 512	see gypsum	
Little Narrows Gypsum Co. Ltd.	Little Narrows, Victoria County	83,044	75 301	see gypsum	
	TOTAL (anhydrite)	220,254	199 813		1,348,738

TABLE B-3. Continued

Company	Location	Production tons	Production tonnes	Total[1] Number Employed[1]	Approximate Value[3]
SALT					
Canadian Salt Co.	Pugwash, Cumberland County	926,372	840 399	175	
Sifto Salt Division	Nappan, Cumberland County	62,461	56 664	98	
Domtar Chemical Group					
	TOTAL (salt)	988,833	897 063	273	40,960,089[3]
LIMESTONE					
Ridge Brokers Ltd.	Southside Harbour, Antigonish County	9,314	8 450	8	
Canada Cement Lafarge, Ltd.	Brookfield, Colchester County	532,789	483 343	18	
Scotia Limestone Ltd.	Irish Cove, Cape Breton County	nil	nil	10	
Mosher Limestone Ltd.	Upper Musquodoboit, Halifax County	105,338	95 562	30	
N.S. Sand & Gravel Ltd.	Marble Mountain, Inverness County	nil	nil		
	TOTAL (limestone)	647,441	587 355	66	4,660,967

TABLE B-3. Continued

Company	Location	Production tons	Production tonnes	Total[1] Number Employed[1]	Approximate Value[3]
DOLOMITE					
Scotia Limestone	Kellys Cove, Victoria County				
	TOTAL (dolomite)	nil	nil	nil	nil
BARITE					
Nystone Chemicals Ltd.	Brookfield, Colchester County	7,917	7 182	18	
Magcobar Division, Dresseer Canada Inc.	Bass River, Colchester County	nil	nil	5	
Scotsville Mineral Resources Limited	Scotsville, Inverness County	nil	nil	8	
	TOTAL (barite)	7,917	7 182	31	1,116,900
SHALE					
L. E. Shaw Ltd.	Milford, Hants County New Glasgow, Pictou County	28,660	26 000	see clay	156,000
CLAY					
L. E. Shaw Ltd.	Lantz, Halifax County	17,637	16 000	4	96,000
	TOTAL (clay and shale)	46,297	42 000	4	252,000

TABLE B-3. Continued

Company	Location	Production tons	Production tonnes	Total[1] Number Employed[1]	Approximate Value[3]
SILICA SAND					
Nova Scotia Sand and Gravel Ltd.	Nine Mile River, Hants County TOTAL (silica sand)	46,297	42 000	11	1,176,000[3]
	TOTAL FOR INDUSTRIAL MATERIALS	8,464,246	7 678 713	840	$91,037,970

[1]total employees: mining, production, clerical, supevisory, etc.
[2]estimate from Nova Scotia Department of Mines and Energy sources
[3]processed or manufactured value

March 3, 1987

Gypsum and Anhydrite

CANADA CEMENT LAFARGE LTD.

Manager:	D. King
Address:	P.O. Box 5, Brookfield, N. S. B0N 1C0
Production:	2,588 tons (2 348 t) gypsum
Employees:	See under Limestone

This small quarry is located just east of Brookfield and operates only to supply the needs of the company's cement plant.

DOMTAR CONSTRUCTION MATERIALS LTD.

Manager:	S. G. Johnson
Address:	P.O. Box 758, Windsor, N. S. B0N 2T0
Production:	12,809 tons (11 620 t) gypsum products
Employees:	12

Domtar Construction Materials reached its highest level of production since 1977 from the quarry at MacKay Settlement. The company installed additional dust collectors at its calcining plant in Windsor to further reduce dust emissions. This is the only operation in the province that undertakes processing of crude gypsum.

FUNDY GYPSUM CO. LTD.

Manager:	G. Raymond
Address:	P.O. Box 400, Windsor, N. S. B0N 2T0
Production:	137,250 tons (124 512 t) anhydrite
	1,483,119 tons (1 345 477 t) gypsum
Employees:	140

Fundy Gypsum produced both anhydrite and gypsum from two separate quarries at Wentworth and Miller Creek near Windsor. Both products are transported by rail to shiploading facilities in Hantsport for shipment to a variety of destinations.

GEORGIA PACIFIC CORPORATION

Manager:	J. Graham
Address:	P.O. Box 400, Port Hawkesbury, N. S. B0E 2V0
Production:	982,911 tons (891 691 t) gypsum
Employees:	55

Production by Georgia Pacific reached record levels in 1985 at its River Denys operation. Development work continued on the Sugar Camp deposit, the site of Georgia Pacific's future quarry. Gypsum is transported by rail to dockside at Port Hastings, where company-owned vessels transport the gypsum to the United States.

LITTLE NARROWS GYPSUM COMPANY LTD.

Manager:	T. H. Davis, P.Eng.
Address:	Little Narrows, N. S. B0E 1T0
Production:	83,004 tons (75 301 t) anhydrite
	1,004,358 tons (911 148 t) gypsum
Employees:	92

Little Narrows Gypsum reached its highest level of production since 1979. It has continued its program of routine maintenance by replacing some 600 ft. of conveyors and a transfer, screening and tertiary crushing facility. Limited production is now coming from the new Norman MacAulay quarry,which eventually will become Little Narrow's main producing quarry. Both anhydrite and gypsum are produced and shipped from the Company's dock on St. Patrick's Channel in the Bras d'Or Lakes to various destinations in Canada and the United States.

NATIONAL GYPSUM (CANADA) LTD.

Manager:	P. Mills, P.Eng.
Address:	P.O. Box 637, Dartmouth, N. S. B2Y 3Y9
Production:	3,021,422 tons (2 741 016 t) gypsum
Employees:	112

National Gypsum operates the largest gypsum quarry in the province at East Milford, which is also the single largest gypsum quarry in the western world. National Gypsum set a new annual production record in 1985 with tonnages up slightly over those of 1984. The company transports the gypsum by rail from Milford to Wright's Cove, where it is loaded on ships bound for various points in Canada and the United States. A program to refurbish the Wright's Cove loading facility commenced this year with the removal of the 30-year-old overhead stacker and installation of a new articulated ore stacker.

Salt

CANADIAN SALT CO. LTD.

Manager:	Wm. McCormick
Address:	P.O. Box 160, Pugwash, N. S. B0K 1L0
Production:	926,372 tons (840 399 t) salt
Employees:	175

The Canadian Salt Co. mine is located in Pugwash, Cumberland County. A room and pillar system of extraction is employed utilizing trackless diesel and electric equipment. The processing plant on-site produces industrial grades of salt, blocks for farm use and refined salt for domestic consumption. The industrial grades are either supplied in bulk for truck transportation, bagged for rail transportation or transported in bulk or bags to storage and shiploading facilities at the Pugwash Harbour wharf.

DOMTAR CHEMICALS GROUP, SIFTO SALT DIVISION

Manager:	R. E. Simmie
Address:	P.O. Bx 550, Amherst, N. S. B4H 4A1
Production:	62,461 ton (56 664 t) salt
Employees:	98

Domtar Chemicals Group, Sifto Salt Division, operates a solution salt mine located near Nappan, Cumberland County. The mining procedure involves drilling a bore hole into the underground salt deposit. Water is pumped down to the deposit, where it dissolves the salt, forming brine. The brine is then forced back to the surface, where the salt is extracted using the "vacuum pan" process.

Barite

NYSTONE CHEMICALS LTD.

Manager:	V. Prostak
Address:	P.O. Box 64, Debert, N. S. B0M 1G0
Production:	7,917 tons (7 182 t) ore mined
Employees:	18

The barite ore is mined, crushed and jigged by a contractor at the company's mine site northeast of Brookfield, Colchester County, to produce a primary concentrate that is shipped to the company's plant at Debert, where it is upgraded in a pharmaceutical product.

NOVEX MINING AND EXPLORATION LTD.

On March 27, 1985, following a ministerial enquiry, Novex was informed that its Mining Lease No. 83-1 was forfeited as of December 6, 1984 for non-compliance with the conditions of the lease.

The reclamation bond has been called by the Province, and plans are going ahead to rehabilitate the mine site.

SCOTSVILLE MINERAL RESOURCES LTD.

Owner: R. S. Patterson
Address: 1000 MicMac Blvd., Dartmouth, N.S. B3A 4M7
Employees: 25

This company is establishing a small barite mine at Scotsville, Inverness County. A quantity of ore has been mined and test milling has been conducted.

Limestone and Dolomite

CANADA CEMENT LAFARGE LTD.

Manager: D. King
Address: P.O. Box 5, Brookfield, N. S. B0N 1C0
Production: 532,789 tons (483 343 t) limestone
Employees: 119

Canada Cement Lafarge Ltd. operates a limestone quarry and plant at Brookfield, Colchester County. The total production from the quarry is processed at the on-site cement manufacturing plant owned and operated by the company.

The plant operated well below its rated capacity due to the current economic conditions. The output of Portland Cement from the plant was approximately 231,420 tons (210 000 t). Additional information about cement production is given in Table B-6.

MOSHER LIMESTONE LTD.

Manager: R. Mosher
Address: P.O. Box 28, Upper Musquodoboit, N.S. B0N 2M0
Production: 105,338 tons (95 562 t) limestone
Employees: 30

Mosher Limestone operates two quarries in the Upper Musquodoboit area of Halifax County and produces an agricultural-grade dolomite and limestone. When processed, the product is supplied in bulk or bagged for wide distribution throughout the Atlantic Provinces as a soil conditioner.

RIDGE BROKERS LTD.

Manager:	A. Alward
Address:	P.O. Box 59, Havelock, N. B. E0A 1W0
Production:	9,314 tons (8 450 t) limestone
Employees:	20

The company operates a small limestone quarry at South Side, Antigonish Harbour, Antigonish County.

SCOTIA LIMESTONE LTD.

Manager:	J. D. Coffin
Address:	P.O. Box 457, Sydney, N. S. B1P 6H4
Production:	Nil
Employees:	10

Production of limestone from the Irish Cove deposit ceased with exhaustion of the deposit. No dolomite was produced from the Kellys Cove deposit in 1985.

Clay, Shale, Industrial Sand, Marble

L. E. SHAW LTD. (NOVA SCOTIA SAND AND GRAVEL)

President:	A. Shaw
Address:	5251 Duke Street, Halifax, N.S. B3J 1P3
Production:	17,673 tons (16 000 t) clay and shale
	46,297 tons (42 000 t) industrial sand
	3,307 tons (3 000 t) marble
Employees:	19

L. E. Shaw and its subsidiary company, Nova Scotia Sand and Gravel, operate seven properties in Nova Scotia. The clay and shale are quarried from pits at Lantz, Milford and Shubenacadie (all in Hants County) and from a quarry in New Glasgow, Pictou County. The materials quarried are used in the company plant located in Lantz, Hants County, for the manufacture of bricks and tiles. The company also produces industrial sand at Elmsdale, Brazil Lake and Sandy Desert, and architectural limestone from the Marble Mountain quarry.

TABLE B-4. Secondary Mineral Manufacturing for the calendar year 1985

Company	Location	Production		Total Number Employed	Approximate Value
Manufactured Bricks					
L. E. Shaw Ltd.	Lantz, Halifax County	16,500,000 Bricks		55	$ 5,775,000[1]
Portland Cement					
Canada Cement Lafarge	Brookfield, Colchester County	231,420 (tons)	210 000 (tonnes)	101	27,510,000[1]
	TOTAL FOR SECONDARY MINERAL MANUFACTURING			156	$33,285,000[1]

[1] estimate from Nova Scotia Department of Mines and Energy sources

Brick production from the Lantz plant was 16,500,000. This plant employed an additional 55 people.

AGGREGATE RESOURCES

Crushed stone and sand and gravel comprise the structural materials category. Production information is summarized in Table B-5 and located on Figure B-3.

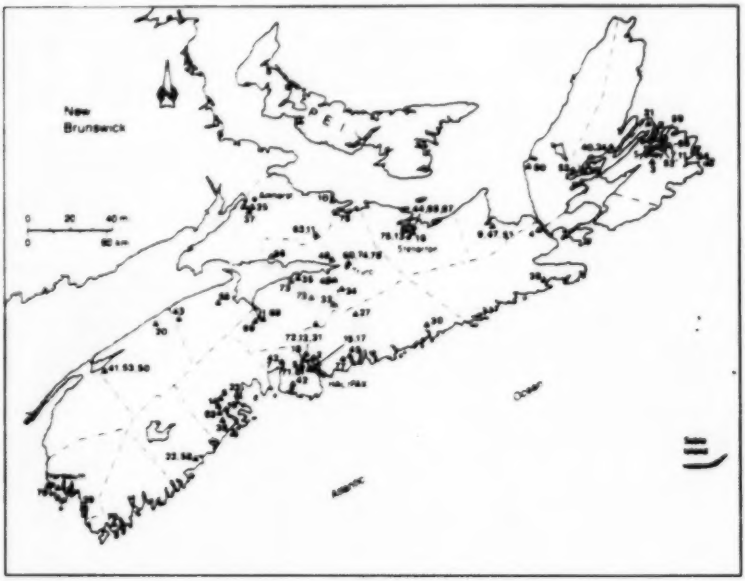


FIGURE B-3. Location of aggregate resources producers.

Crushed Stone

The Province had 16 rock quarry operations that produced a total of 6,365,387 tons (5 774 641 t) in 1985 and employed 270 men.

Sand and Gravel

There were 75 private sector producers of sand and gravel operating in the province. Production was 6,428,921 tons (5 832 297 t) and 460 people were employed. Total production, which includes production for the Nova Scotia Department of Transportation, was 6,774,652 tons (6 055 223 t).

TABLE B-5. Aggregate resources production for the calendar year 1985

	Company	Location Head Office	Production tons	Production tonnes	Total[1] Number Employed[1]	Approximate Value[2]
	CRUSHED STONE					
1.	Avard Salter Excavating Ltd.	Newport, Hants County	14,119	12 809	4	
2.	Conrad Brothers Ltd.	Montague, Halifax County	959,001	870 000	66	
3.	Doug Burns Excavation Contracting Ltd.	Sydney, Cape Breton County	40,785	37 000	2	
4.	Construction Aggregates Ltd.	Mulgrave, Guysborough County	999,786[2]	907 000[2]	40[2]	
5.	Gateway Materials Ltd.	Kearney Lake Rd., Halifax County	1,087,886	986 924	20	
6.	Lawrence S. Veinotte Enterprises Ltd.	New Cornwall, Lunenburg County	1,488	1 350	1	
7.	LeVatte Construction Company Ltd.	Sydney, Cape Breton County	126,997	115 211	7	
8.	Dan MacKinnon	Sydney Mines, Cape Breton County	8,499	7 710	4	
9.	Colin R. MacDonald Ltd.	Antigonish, Antigonish County	5,060	4 591	6	
10.	North Shore Construction Co. Ltd.	Wallace, Cumberland County	1,102	1 000	3	
11.	Permanent Concrete	Folly Lake, Colchester County	262,502	238 140	8	
12.	Rocky Lake Quarry Ltd.	Bedford, Halifax County	1,377,875	1 250 000	35	
13.	Satellite Equip. (1975) Ltd.	New Glasgow, Pictou County	241,361	218 961	11	
14.	South Shore Sand & Gravel Ltd.	Bridgewater, Lunenburg County	96,820	87 835	10	

TABLE B-5 Continued

	Company	Location Head Office	Production tons	Production tonnes	Total[1] Number Employed[1]	Approximate Value[2]
15.	Steed & Evans Ltd.	Dartmouth, Halifax County	97,002	88 000	12	
16.	S. W. Weeks Const. Ltd.	New Glasgow, Pictou County	143,299	130 000	8	
17.	W. Eric Whebby Ltd.	Dartmouth, Halifax County	551,150	500 000	23	
		TOTAL (crushed stone)	6,014,734	5 456 531	260	$27,118,959
	SAND AND GRAVEL					
18.	Aberdeen Paving Ltd.	Halifax, Halifax County	710,984	645 000	38	
19.	Acadia Road Contractors Ltd.	Bridgewater, Lunenburg County	145,118	131 650	16	
20.	Bert Balcom Excavating	Middleton, Annapolis County	17,635	15,998	2	
21.	Briggs Construction	Bras D'Or, Cape Breton County	9,370	8 500	7	
22.	Budget Paving Ltd.	Liverpool, Queens County	12,000	10 886	4	
23.	Clearland Enterprises Ltd.	Mahone Bay, Lunenburg County	26,455	24 000	10	
24.	Gordon F. Creelman Ltd.	Stewiacke, Colchester County	7,491	6 796	1	
25.	Cumberland Paving & Contr. Ltd.	Amherst, Cumberland County	88,184	80 000	16	
26.	D and I Contracting Ltd.	Little Narrows, Victoria County	34,642	31 427	4	
27.	Day and Reid	Shubenacadie, Hants County	600	544	2	
28.	Raymond Delorey Dozing	Larry's River, Guysborough County	59,524	54 000	3	
29.	Gus D'Eon Excavating Ltd.	West Pubnico, Yarmouth County	44,643	40 500	6	
30.	Dewdrop Gardens	Sheet Harbour, Halifax County	4,464	4 050	2	
31.	Dexter Construction Ltd.	Bedford, Halifax County	206,113	187 166	4	

TABLE B-5 Continued

	Company	Location Head Office	Production tons	Production tonnes	Total[1] Number Employed[1]	Approximate Value[2]
32.	Dillman Enterprises Ltd.	Shubenacadie, Colchester County	715,939	649 496	16	
33.	Dominion Atlantic Railway (C.P.R.)	Saint John, New Brunswick	35,274	32 000	—	
34.	Dunn Const. Co. Ltd.	Baddeck, Victoria County	45,856	41 600	7	
35.	Ettinger Enterprises Ltd.	Noel, Hants County	3,720	3 375	1	
36.	R. B. Furguson Construction	Sydney, Cape Breton County	22,321	20,250	4	
37.	G. & B. Construction Ltd.	Nappan, Cumberland County	4,464	4 050	6	
38.	John W. Fancy	Bridgewater, Lunenburg County	5,208	4 725	2	
39.	L. & M. Gallant Contr., Trucking Ltd.	Elmsdale, Hants County	45,856	41 600	3	
40.	Gillis Const. (C.B.) Ltd.	Baddeck, Victoria County	2,205	2 000	3	
41.	W. C. Hall & Sons Excavating Ltd.	Cornwallis, Annapolis County	11,904	10 800	7	
42.	Hatchet Lake Excavations	Armdale, Halifax County	26,042	23 625	5	
43.	Roy Hiltz Excavators Ltd.	Kingston, Kings County	38,020	34 492	7	
44.	Inter Supply Ltd.	New Glasgow, Pictou County	121,253	110 000	11	
45.	Francis Johnson Ltd.	Head Chezzetcook, Halifax County	13,026	11 818	15	
46.	G. K. Kedy (L. E. Shaw)	Lantz, Hants County	71,319	64 700	1	
47.	Kell's Enterprises Ltd.	Antigonish, Antigonish County	26,455	24 000	5	
48.	Latimer Construction Ltd.	Truro, Colchester County	11,023	10 000	4	
49.	LeVatte Construction Company Ltd.	Sydney, Cape Breton County	38,025	34 496	3	
50.	D. J. Lowe Ltd.	Deep Brook, Annapolis County	27,558	25 000	5	
51.	Colin R. MacDonald Ltd.	Antigonish, Antigonish County	246,203	223 354	26	

TABLE B-5 Continued

	Company	Location Head Office	Production tons	Production tonnes	Total[1] Number Employed[1]	Approximate Value[2]
52.	Malcolm S. MacDonald Co. Ltd.	Sydney River, Cape Breton County	64,478	58 494	4	
54.	Martell's Const. Ltd.	North Sydney, Cape Breton County	150,686	136 701 15		
56.	Meadows Sand & Gravel Ltd.	Sydney, Cape Breton County	104,719	95 000	7	
57.	Moore Enterprises	Deep Brook, Digby County	14,881	13 500	4	
58.	Mosher & Rawdling Ent. Ltd.	Sydney, Cape Breton County	503,729	456 980	21	
60.	North River Sand & Gravel Ltd.	Truro, Colchester County	7,000	6 350	7	
61.	Nova Scotia Sand & Gravel Ltd.	Halifax, Halifax County	440,920	400 000	23	
62.	G. W. Oickle	Bridgewater, Lunenburg County	5,250	4 763	3	
63.	Permanent Concrete Ltd.	Folly Lake, Colchester County	353,413	3220 614	9	
64.	H. W. Phillips Ltd.	Mia Gut, Cape Breton County	99,207	90 000	10	
65.	Pictou County Excavators Ltd.	New Glasgow, Pictou County	2,205	2 000	10	
66.	Arthur Pugsley	Five Islands, Colchester County	2,061	1 870	2	
67.	Scott Paper International	New Glasgow, Pictou County	328,074	297 627	—	
68.	Reid J. Shanks Ltd.	Windsor, Hants County	16,534	15 000	16	
69.	V. H. Shaw	Avonport, Kings County	53,131	48 200	2	
70.	D. M. Snow Construction	Barrington Passage, Shelburne County	10,417	9 450	4	

TABLE B-5 Continued

	Company	Location Head Office	Production tons	Production tonnes	Total[1] Number Employed[1]	Approximate Value[2]
71.	Standard Paving Maritime Ltd.	Halifax, Halifax County	378,932	343 765	28	
72.	Tidewater Const. Co. Ltd.	Lower Sackville, Halifax County	266,757	242 000	29	
73.	Timberland Holdings	Hantsport, Hants County	416	377	—	
74.	Earle Toole Trucking Ltd.	Truro, Colchester County	26,979	24 475	4	
75.	Warren Maritimes Ltd.	New Glasgow, Pictou County	384,099	348 452	16	
76.	Herbert Waugh	Malagash, Colchester County	1,433	1 300	3	
77.	Max White Excavating	Porters Lake, Halifax County	18,000	16 330	6	
78.	Will-Kare Paving & Const. Ltd.	Truro, Colchester County	147,467	133 781	7	
79.	Yarmouth Concrete & Gravel Ltd.	Yarmouth, Yarmouth County	88,184	80 000	9	
80.	Zutphen Brothers Const. Ltd.	Port Hood, Inverness County	7,716	7 000	1	
		Subtotal	6,481,510	5 879 987	496	24,519,545
		NON-REPORTING (mainly Nova Scotia Department of Transportation)	1,941,416	1 761 241	67	7,344,375
		TOTAL (sand and gravel)	8,422,926	7 641 228	563	31,863,920
		TOTAL FOR AGGREGATE MATERIALS PRODUCTION	14,437,659	13 097 759	823	$58,982,879

[1]Locations of Head Offices are shown by number on Figure.
[2]Estimate from Department of Mines and Energy sources.

MISCELLANEOUS MATERIALS

The production of miscellaneous materials is shown in Table B-6. Locations are given on Figure B-2.

Dimension Stone

HERITAGE MEMORIAL LTD.

Owner:	M. Nelson
Address:	P.O. Box 308, Windsor, N.S. B0N 2T0
Production:	625 tons (567 t)
Employees:	21

The company periodically operates a small quarry at Nictaux West, Annapolis County, to obtain grey granite as part of its requirements for memorial works at Windsor. The operation depends on market requirements.

ARSENAULT MONUMENT WORKS LTD.

Owner:	P. Arsenault
Address:	P.O. Box 1475, Antigonish, N.S. B3B 2L4

Arsenault Monument Works Ltd. periodically operates a quarry at Loch Katrine, Antigonish County, for the production of dimension stone used in memorials. No production was recorded in 1985.

Peat Moss

ANNAPOLIS VALLEY PEAT MOSS CO.

President:	H. Endres
Address:	Berwick, Nova Scotia B0P 1E0
Production:	6,437 tons (5 840 t) peat moss
Employees:	25 (some part-time)

The peat bog is some 500 acres (200 ha) in area and, depending on the weather, up to 19,600 cubic feet (500 m^3) per day are harvested during the five summer months.

TABLE B-6. Miscellaneous commodity production for the calendar year 1985

Company	Location	Production tons	Production tonnes	Total Number Employed[1]	Approximate Value[2]
DIMENSION STONE					
Heritage Memorials Ltd.	Quarry: Nictaux, Annapolis County Plant: Windsor, Hants County	625	567	21	$ 70,875
Nova Scotia Sand & Gravel	Quarry: Marble Mountain, Inverness County	3,307	3 000	4	18,000
	TOTAL (dimension stone)	3,932	3 567	25	88,875

TABLE B-6 Continued

Company	Location	Production tons	Production tonnes	Total Number Employed[1]	Approximate Value[2]
PEAT MOSS					
Annapolis Valley Peat Moss Company	Berwick, Kings County TOTAL (peat moss)	6,437	5 840	61	1,280,624[3]
	TOTAL FOR MISCELLANEOUS COMMODITY PRODUCTION	10,369	9 407	86	$1,369,499

[1]total number of employees including office, clerical, supervisory, mining and production
[2]estimate from Nova Scotia Department of Mines and Energy sources
[3]processed or manufactured value

March 11, 1987